REVIEW

OF THE

FOREST ADMINISTRATION

IN THE

SEVERAL PROVINCES UNDER THE GOVERNMENT OF INDIA,

FOR THE YEAR 1877-78.

BY

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Dated the 20th August 1879.

SIMLA:

GOVERNMENT CENTRAL BRANCH PRESS

1879.

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Summary of Administration.

Introduction.

The reviews of Forest administration in the provinces under the Government of India for the four years from 1873-74 to 1876-77 were purposely kept as brief as possible, and were not intended to be more than a skeleton, giving the leading facts and figures relating to the year under review. It will now be convenient to present a more comprehensive view of the work that has been accomplished during the year in the different provinces. The difficulty of this task consists in this, that the conditions of climate and Forest growth and other circumstances which affect Forest administration in the districts and provinces to which this report relates, are widely different, and that generalizations must either be avoided, or be made most sparingly and with the greatest caution.

Forest management essentially local.

2. Forest management must always be essentially local; its operations are governed not only by the peculiar climate and character of Forest growth of each district and province, but equally so by the demands of trade, the land tenures, and the customs regarding the use of the waste and Forest on the part of the agricultural population and by other consumers which prevail in each district. Yet on the other hand Forest administration in all provinces and districts is, or ought to be, governed by the same general principles, and hence a comprehensive review of the progress made, even under different conditions of climate and otherwise, cannot fail to be useful and instructive.

Period to which reports relate.

3. The provincial reports, upon which the present review is based, relate to the financial year ending on the 31st March 1878, in regard to area, the working of the Forests and the financial results. In regard to fire protection they extend to the 30th June 1878, and the Forest Survey Report relates to the year ending on the 30th September 1878.

Like its predecessor the present review is late, chiefly on account of the late receipt of the provincial reports which necessitated the compilation of the review being deferred until the completion of the annual tours of inspection and the return in June last of the Inspector General of Forests to head-quarters. Arrangements have however now been made which it is hoped will ensure a more punctual receipt by the Government of India of the provincial reports, and if these arrangements have the desired effect the general review will in future be published within a reasonable time after the period to which the provincial reports relate.

Arrangement of headings.

4. The arrangement of headings remains the same as hitherto; the first and most important chapter being assigned to those forests which have been set apart and demarcated to be permanently maintained as Forest. Since Forest management commenced in India, these Forests have generally been

known as *Reserved Forests*, and as some of them are held on lease from Native States, the heading of that chapter will remain, as heretofore, "*Reserved and Leased Forests.*"

The second chapter treats of the forests which have not been set apart and demarcated to be permanently maintained as such. These have hitherto been designated as "*Unreserved Forests*" and will under the Indian Forest Act in future be known as "*Protected Forests.*"

As regards the Protection of Government Forests as well as the Yield and Financial results, it is not yet possible to separate what has to be said with reference to the Reserved and Unreserved Forests, and under these circumstances the existing arrangement will be continued, under which the third and fourth chapter deal with the Protection, the Yield and Financial results of the management of Government Forests generally.

Indian Forest Act.

5. The most important event of the year under review was the passing of the Indian Forest Act. In 1865 the Government Forests Act was passed, the object of which was to enable Local Governments to make rules, having the force of law, for the management and preservation of such lands covered with trees, brushwood or jungle, as might from time to time be declared Government Forests, and be made subject to the provisions of the Act. The declaration of Government Forests and the making of Rules under that Act was subject to the proviso that existing rights of individuals or communities should not be abridged or affected. Shortly after it had been passed the Act of 1865 was found to be insufficient, and as long ago as 1868 proposals for its amendment were submitted to Government. Draft Bills were prepared and circulated for the opinion of the local authorities in December 1868 and in November 1870. In 1875 a memorandum was published by the writer of this review entitled "*Memorandum on the Forest Legislation proposed for British India*" in which the subject was discussed in all its bearings, and definite suggestions regarding Forest legislation for India were made. The present Act embodies the result of the discussions which these proposals have at different times elicited.

Forest management in India in a transition state.

6. Before the general scope of the Indian Forest Act can be fully understood it should be explained that Forest management in India is, and must for many years to come be, in a transition state. If the development of the country is permitted to progress evenly, there will doubtless eventually be in India the same great classes of Forest property which are found on the continent of Europe, *viz.*:—

First.—State Forests.

Second.—Forests of towns, villages and other communities and public corporations or institutions, such as churches, schools and hospitals.

Third.—Forests of private proprietors.

But these classes do not yet exist, and the separation into classes of the great mass of waste lands and Forest, over which the State, communities and private persons exercise rights, has not yet been accomplished. The separation however is in progress, and hence Forest legislation in India must provide for the present transition state.

General scope of Act.

7. The provisions of the Act may be grouped under three great heads: *First* the care of Forests, *second* the control of timber and Forest produce in transit, and *third* the prosecution of offences and penalties.

The care of Forests is arranged under five chapters, of which one deals with the constitution and protection of Reserved Forests, a second provides for the constitution of Village Forests, while a third relates to those Government Forests which are not included within Reserved Forests or constituted as Village Forests. This class the Act designates as Protected Forests. A chapter containing provisions of a temporary character, prescribing the manner in which Forests which at the time the Act was passed were under the control of Government for purposes of Forest conservancy shall be classified, completes

the provisions relating to Government Forests, and the last chapter appertaining to this head deals with the control over Forests which are not the property of Government.

8. Returning to the chapters which relate to Government Forests, it should first be stated that though the term "*Government Forest*" does not occur in the Act it may here be conveniently used, in order to denote the lands defined in sections 3 and 28 as "*Forest land or waste land, which is the property of Government or over which the Government has proprietary rights or to the whole or any part of the Forest produce of which the Government is entitled.*" Reserved Forests.

Such lands the Act empowers Government to constitute either as Reserved Forests, or Village Forests, or Protected Forests.

The provisions regarding the formation and protection of Reserved Forests correspond to those chapters which in the Forest laws of the continent of Europe relate to State Forests. Indeed it may safely be predicted that eventually, when the separation of rights in the large area of Government Forest and waste shall have been accomplished, the Reserved Forests in India will occupy the position of State Forests and will be thus designated. To designate them as State Forests at present would in so far not be expedient, as there are large areas of Forest belonging to the State which are not included in the Reserved Forests.

Sections 3 to 21 prescribe the procedure for constituting Reserved Forests, and the enquiry into and settlement of the rights enjoyed by the population in their vicinity.

Sections 22 and 23 provide that no fresh rights shall be acquired by prescription in a Reserved Forest, that no right recognized to exist in a Reserved Forest shall be alienated without the sanction of Government, and that no produce obtained in exercise of any such right shall be sold or bartered unless the right to sell or barter has been expressly admitted. Section 24 gives power under certain conditions to close roads and watercourses passing through Reserved Forests. Section 25 enumerates the acts prohibited in a Reserved Forest, provides penalties, and lays down the exceptions under which those acts are not punishable. Lastly, section 26 lays down that with the sanction of the Governor General in Council the Local Government may declare that a Forest may cease to be a Reserved Forest.

9. The provisions relating to Village Forests to some extent correspond to those chapters which in the Forest Laws of Europe regulate the management of Communal Forests, with this difference that in the Indian Act it is assumed that Village Forests will consist of Government land, which has been assigned to villages, while the Communal Forests in Europe consist of land which is the property of villages and other communities. At the present time no practical difficulty need be anticipated, but there are instances in India where Forest lands and waste lands are the property of village communities and yet, being communal, that is public property, require to be made subject to the Forest Act in a manner not provided for by Chapter VI, which deals with private forests. Eventually therefore the provisions of this chapter will have to be amplified in this respect. In the Hazara district of the Punjab, to which the Forest Act does not apply, a Regulation passed in 1879 contains provisions for the management of Village Forests which partly at least are the property of village communities. Village Forests.

10. Chapter IV provides for the care of Forest growth on those Government lands, which are not included within Reserved or Village Forests, and these the Act designates as Protected Forests. These lands are available for the extension of cultivation, and as time progresses a large proportion will cease to be Forest, while certain areas will be added to the Reserved Forests, others being constituted Village Forests. The provisions of this chapter, therefore, are necessarily of a more or less transitory character. Protected Forests.

11. Most important and particularly well framed are the provisions of Chapter VI, which treat of the protection and improvement of Forests and lands not the property of Government. The interference of the State with private lands is authorized in the interest of the public welfare for certain clearly Control over Forests and lands not the property of Government.

defined purposes. Whenever the maintenance of existing Forests or the creation of new Forests or other works of a similar character are required to ensure protection against storms and floods, the preservation of the soil, the maintenance of a water-supply, the protection of lines of communication and the preservation of the public health, it will rest with Government to prohibit the breaking up or clearing of land for cultivation, the pasturing of cattle and the firing or clearing of the vegetation, and to construct, at the expense of Government, such works as may be necessary. The land to which these measures are applied may, in certain well defined cases, be declared subject to all or any of the provisions relating to Reserved Forests. The net profits arising from the management of such Forest or land will be paid to the proprietor, and it will rest with him, within a certain fixed period from the date of the order, to require that the Forest or land be acquired by Government under the Land Acquisition Act.

This chapter also provides that if the owners of any land should desire that all or any provisions of the Act be applied to such land and that such land be managed by the Forest Officer on their behalf, the needful orders may be passed by Government to that effect.

Miscellaneous provisions regarding Forests.

12. Certain other provisions relating to the care of Forests will be found in the last chapter which is headed "Miscellaneous." Section 78 prescribes that persons who enjoy the user of any Government Forest, whether by right or by permission, and any person employed by Government or who receives remuneration from Government for services performed to the community, is bound to give information regarding Forest offences, to assist in discovering and arresting the offender, and in preventing and extinguishing fires in the Forest.

Section 79 regulates the management by Government of Forests and waste lands in which Government and other persons are jointly interested, and section 80 prescribes the proceedings to be taken against any person who fails to perform service for which he is entitled to a share in the produce of any Government Forest. Lastly, section 83 provides that land required for any of the purposes of this law may be acquired under the Land Acquisition Act.

Control of timber and Forest produce in transit

13. Chapter VII gives authority for levying duty upon timber produced in British India and in respect of which Government has rights, or which is brought from any places beyond the frontier of British India. Chapter VIII regulates the control of timber and other Forest produce in transit by land or water, and Chapter IX regulates the collection of drift and stranded timber.

The object of the provisions of these chapters is the protection not only of Government timber but equally so of private timber while adrift or in transit, against unlawful appropriation, the altering of marks and other dishonest practices. The provisions of these chapters are chiefly required in those provinces where quantities of timber are floated down by river on a large scale.

Penalties and procedure.

14. The penalties provided by the Act are—confiscation of Forest produce unlawfully obtained and of tools, boats, carts and cattle used in committing any Forest offence, as well as imprisonment and fine. In ordinary cases the maximum limit fixed by the Act is imprisonment for six months, and a fine of five hundred rupees. In the case of offences relating to timber or other Forest produce in transit, the court is authorized (by section 42) to inflict double penalties in cases where the offence was committed at night or after preparation for resistance or in case of a repetition of the same offence. Imprisonment up to two years may be awarded for counterfeiting, altering, defacing or obliterating marks on timber or standing trees, and for interfering with the boundary marks of any land to which the Act applies, if these acts are committed with intent to cause damage or injury to the public or any person, or to cause wrongful gain. In the case of cattle trespass (Chapter XI) the Act provides a special maximum scale of fines.

Section 67 lays down the rules under which Forest Officers may compromise with offenders, if authorized in that behalf by the Local Government. Officers thus authorized may accept a sum of money by way of compensation for any damage which may have been committed, and thus obviate the necessity of taking

offenders and witnesses before the Magistrate. A similar system was introduced in the Communal and State Forests of France by a Law of June 1859, and its effect has been most beneficial in that country, in saving the time of Forest Officers and in diminishing bad feeling against the Forest Administration.

15. Under section 63 Forest and Police Officers have power, under certain circumstances, to arrest without warrant, and section 71 authorizes Local Governments to invest any Forest Officer with certain powers, the most important of which are the power to compel the attendance of witnesses and the production of documents, to issue search warrants, to hold enquiries and to receive and record evidence. Lastly, by Rule 74, Forest Officers are prohibited to trade in timber or other Forest produce, or to become interested in any lease or contract for working a Forest. Forest Officers.

These are the chief provisions of the Indian Forest Act which, though it may eventually require amendment in some respects, is well adapted to the requirements of Forest Administration in most provinces of India.

16. As regards general administration, important and noteworthy measures are reported from Bengal, British Burma, the Central Provinces and the Punjab. In Bengal the Report for 1876-77 recorded the transactions under five Divisions, but during the year under review their number was increased to eight, which are as follows:— Administrative changes. Forest divisions in Bengal.

1. Darjeeling Division.
2. Teesta „
3. Kurseong „
4. Jalpaiguri „
5. Buxa „
6. Palamow „
7. Sunderbuns „
8. Chittagong „

This organization was effected by subdividing the old Darjeeling and Jalpaiguri Divisions—a measure rendered necessary by the area and importance of the Forests and the large extent of country over which they are distributed. The Darjeeling and Teesta Divisions now comprise the Forests in the hills, the produce of which is required for the supply of the tea plantations and the station of Darjeeling. In Kurseong the most important Forests are those of the Darjeeling Terai, while the large and valuable forests of the Western Dooars are included in the Jalpaiguri and Buxa Divisions.

17. In this manner it has been possible so to arrange the northern portion of the Bengal Forests as to have five divisions of manageable extent, and this is a most important step in advance. Each Division is in charge, or ought, if the superior staff were strong enough, to be in charge of an experienced and professionally skilled officer. Under him are (where the strength of the establishment permits), or ought to be, a number of Rangers and Foresters, each in charge of his range, and below these again are, or ought to be, the Forest guards or Protective Officers, each responsible for the protection of his beat. To lay down at present any definite principles regarding the maximum area of beats, ranges and divisions, is out of the question, for this must vary in different districts according to circumstances, and moreover the strength of the superior staff and of the forest establishments must to a great extent be regulated by the amount of revenue produced. The revenue however has not yet developed sufficiently to enable Government to provide the staff and establishments that are required to ensure the efficient protection and systematic management of all Forest ranges. But so much may be said, that under a good organization a Forest guard's beat should not be larger than can be efficiently protected by one man; that a Forest ranger ought as a rule to be able without inconvenience and without special arrangements to visit the most distant beat of his range in a day's ride from his head-quarters; and that a division should not be larger than be efficiently controlled by the Divisional Officer, who ought to be able, without great preparations and without his visit being made known beforehand, to visit each range under his control. Divisions of manageable size.

Effect of this organization upon the training of subordinates.

18. An organization which fulfils these conditions will make it possible to entrust rangers with complete executive charge of their ranges, and if this is done it will eventually not be difficult to select the most efficient and trustworthy rangers, and to promote them to the superior or controlling branch of the service. But it is obvious that the first step in this direction must be the establishment of Forest divisions of manageable size. The organization framed during the year under review by Dr. Schlich, for the Northern Forests of Bengal, is therefore an important move towards the establishment of a complete system of administration, and towards educating Native Forest rangers and making those among them who have received a sufficiently good education fit eventually to discharge the duties of controlling officers.

Burma, appointment of two Conservators.

19. In Burma, the charge of the Forests has been divided among two Conservators. This was first done as an experimental measure in October 1876; the arrangement has been allowed to continue, and has been recognized as a permanent necessity in the year under review. One Conservator now has charge of the Forests in Martaban and Tenasserim, comprising those on the tributaries of the Salween river and in Tavoy and Mergui, while the other has the Pegu Circle, including the valley of the Sitang river, the timber from which comes into Rangoon. The two Forest Circles are separated by the high range of mountains which divide the Sitang valley from that of the Salween and its tributaries. This arrangement was an unavoidable necessity. Considerable progress in demarcation, in teak plantations and in Forest management generally had been made in the Forests which constitute the Pegu Circle, but the Conservator's attention had been almost exclusively devoted to this portion of his charge, and he found no leisure to do more than pay occasional short visits to the Forests on the Moulmein side. The result was that the Forests on the Salween and its tributaries, and those in South Tenasserim were neglected, and the wasteful system of Toungya cultivation carried on in them by the Karens threatened to exterminate the best teak producing tracts. The demarcation of Forests both in the Pegu and in the Tenasserim Circle requires the personal presence on the spot of the Conservator and his officers for months together, and thus the only possible solution of the difficulty was, to divide the charge which was far too extensive for one man, and to form two Conservators' charges of manageable extent.

Central Provinces—relation of Forest and Civil officers.

20. In the Central Provinces important changes in the organization of Forest Administration were made during the year. Formerly the arrangement was this, that the Reserved Forests were in charge of the Forest Officers, and the Government waste and Forests not included in the Reserved Forests, and termed Unreserved Forests, were in charge of Deputy Commissioners. It had for sometime been considered desirable to utilize the Forest Officers to a larger extent in the management of the Unreserved Forests, and at the same time to place them in a definite subordinate relation to the Deputy Commissioners, and in order to accomplish this, the Inspector General of Forests, at the close of an inspection of the Forests in the Central Provinces, which extended over two seasons, submitted in April 1877 the plan of an organization framed on the model of one which had been proposed by him for the Bombay Presidency in 1870, and which had been found to work in a satisfactory manner. In order clearly to explain the system adopted in the Central Provinces, it will be well in the first instance briefly to state the main features of the organization which was introduced in the Bombay Presidency in 1870.

Organization in the Bombay Presidency.

21. The proposals referred to did not relate to Sind, but to the main portion of the Bombay Presidency, which extends from Guzerat to Kanara. The first step was to make all Forest divisions conterminous with civil districts, and to appoint an officer to the Forests in each district styled the District Forest Officer. The District Forest Officer was to have charge of all Forest business in the Collectorate and in all ordinary matters he was made subordinate to the Collector. At the same time the Conservator was made responsible for the economical working of the Department, and the control of all financial, professional and departmental matters was vested in him. The business of the year was to be regulated by an annual plan of operations, prepared by the District Forest Officer, and submitted with the Collector's

remarks to the Conservator. The Conservator was to take the initiative in all matters of a professional character, relating to felling, planting and other operations, but his orders on these matters were to reach the District Forest Officer through the Collector, who had power to object to the Conservator's orders provided any differences of opinion between him and the Conservator were referred at once to superior authority. The Collector, it was said, should not issue orders to the District Forest Officer affecting Forest management direct, but he would be at liberty to order him to proceed to any particular locality, a copy of such order being sent for the information of the Conservator. All correspondence between the District Forest Officer and the Conservator should be sent through the Collector, who might make such comments as he might deem advisable. It was also provided that the Conservator should be the controlling authority in all matters of patronage of subordinate establishments, and in all matters of departmental discipline; and it was stipulated, that the Conservator should be kept regularly informed of all orders issued on Forest matters by Government, the Revenue Commissioners and Collectors; that he should be made acquainted with all business that passed between Collectors and District Forest Officers; and that, as a rule, he should be consulted on all Forest business that came before Government or the Revenue Commissioner. These were the orders passed by Government on the Inspector General's proposals, and this organization has, on the whole, been maintained, and has been found to work in a satisfactory manner.

It must not, however, be supposed that this organization has done away with all difference of opinion between Revenue and Forest officers. Differences of opinion have not ceased, but the advantage is that they are taken up and decided at once, and that such differences of opinion do not interfere with the regular progress of business.

Simultaneously with this organization, the charge of the Forests in this part of the Bombay Presidency which were formerly under one Conservator, was divided into two Conservators' charges, one being appointed for the Northern, the other for the Southern Division. By this arrangement the Conservator in each Division had leisure and opportunities for exercising control in detail over the professional, financial and departmental matters vested in him, and experience has shown that under this arrangement the Conservator's authority is sufficiently guarded by the provisions of this organization.

22. In the Central Provinces circumstances necessitated a somewhat modified arrangement. The greater portion of the Forests intended to be permanently maintained as such have been demarcated as Reserved Forests, and many of these are situated partly in one, partly in other districts, and it was not found practicable to establish a separate administration in the different portions of one reserve which appertain to different civil districts. Moreover it was considered that the existing organization, under which the Reserved Forests are under the exclusive control of the Conservator of Forests, worked in a satisfactory manner, and it did not appear expedient to disturb it. Under these circumstances it was arranged that the District Forest Officer should, as regards the Unreserved Forests of his district, be the assistant for Forest matters to the Deputy Commissioner, and should receive all his orders from or through him. As regards the Reserved Forests he is, as heretofore, directly under the control of the Conservator and receives orders from that officer alone. In this manner it has been possible to attach to a District Forest Officer's charge reserves or portions of reserves, which are situated in an adjoining district. Under these provisions the Deputy Commissioner remains responsible for the management of the Unreserved Forests in his district; his power of control over these lands is not lessened, but in all questions of management he is strengthened by the advice and assistance of the District Forest Officer. The Conservator retains the exclusive control of the Government Estates, which have been separately demarcated to be permanently maintained as Forest, and he has under the Chief Commissioner's orders, a share in the control of the other Government Forests in respect of professional and departmental matters.

Organization in the Central Provinces.

Advantages of organization

23. By placing the District Forest Officer in definite subordination to the Deputy Commissioner, the organization here sketched aims at establishing more intimate relations between the Forest and Civil administration. It was unavoidable, in establishing an entirely new branch of business, *viz.*, the administration of Forests, to pay attention in the first instance chiefly to the organization of a competent Staff of Officers, united by common duties and interests. And the opposition against rational Forest administration which at the outset manifested itself in most provinces, has to some extent had the effect of creating the impression, that Forest administration was a business apart from the general administration of the country, aiming at the accomplishment of its own ends and purposes. The most effective remedy against the spread of these erroneous views is to bind together as closely as possible the administration of Forests with the general administration of the country, and an organization like that introduced in the Bombay Presidency and the Central Provinces is an important measure in this direction. One of the advantages of such an organization is that junior Forest Officers, working under the immediate control of experienced Civil Officers, and as their assistants, receive an excellent practical training in public business, and become acquainted with many subjects important for their duties, of which otherwise they would remain ignorant. They learn to feel that they form part of the general administration of the country, and they have the further great advantage of commanding more readily the help of the subordinate Civil Officers in Forest matters.

Punjab—Bashahr lease.

24. In the Punjab, Government has placed the administration of the Forests leased from the Bashahr State upon a more satisfactory footing, by concluding a new lease with His Highness the Raja. This lease is in the place of an agreement concluded in June 1864 for the Forests, and another executed in August 1871 for the right to waif, drift, and windfall timber. The new lease will be in force for a term of fifty years, and will on the expiry of that term be renewable at the pleasure of the British Government for a further term of fifty years, and afterwards in like manner at the end of every term of fifty years. In consideration of an annual payment of Rs. 10,000, His Highness the Raja grants to the British Government the entire and sole control of the whole Forests of Bashahr, as well as all his rights in waif, drift, and windfall timber within his territory. Rules to regulate the administration of the Forests are appended to the lease, and are declared to be in force in Bashahr during the lease. Forest Officers may be invested with magisterial powers for the purpose of trying and punishing offences against these rules, and the Raja engages to render every aid required by the officers authorized to exercise such powers, for bringing to justice persons charged with offences against the rules and for enforcing any lawful judgment awarded against them. The lease also vests in the British Government the preservation, control, and right of shooting game birds in the Bashahr Forests. The agreement is a short and well drawn document, and under its provisions the management of the Bashahr Forests ought not only to be successful as regards the supply of Deodar timber to the plains, but equally beneficial in promoting the well-being of the people of Bashahr. The lease applies to the whole Bashahr territory, including the Forests on the Upper Sutlej and its feeders, as well as those situated on the Pabar and Rupin rivers, which being tributaries of the Tons, belong to the system of the Jumna river, and the charge of which in 1870 was transferred to the Government of the North-Western Provinces, in order to facilitate the control of the timber floated from these Forests.

Forest Department Code and accounts.

25. Shortly before the beginning of the year under review, *i.e.*, in February 1877, a code of instructions for the conduct of the business and the regulation of accounts in the Forest Department was published; and on the 1st April 1877 a new system of accounts was introduced under which the Forest accounts of the principal provinces under the Government of India are rendered to, and audited by, the Comptroller General, a Forest Officer being for that purpose attached to his office as his assistant for the Forest accounts. Only the accounts of the non-British Provinces, Berar and Mysore, are rendered to the Local Accountants General.

26. In September 1877 the Inspector General of Forests submitted to Government a report proposing the establishment of a Central Forest School, in which native apprentices should be trained for the Office of Forest Ranger, and which should eventually also be used to prepare Forest Rangers and others for service in the superior Staff of the Department. The proposal was to set apart certain Forest Divisions in the North-Western Provinces under a separate Conservator, who should also be Director of the Forest School, and to use these Forests to give young men from other provinces practical training, combined with instruction in surveying, mathematics, forestry, and in other matters connected with their profession. No action, however, was taken on his proposal in the year under review. Proposal to establish a Central Forest School.

27. In August 1877 orders were received for the preparation of a collection of specimens of Indian timbers and other Forest produce for the Paris Exhibition of 1878. As it was necessary for this purpose to bring together a considerable quantity of timber from all provinces, in order to select the best specimens for the Exhibition, it was determined to utilize this material, and at the same time to prepare a number of collections for Conservators' Offices in the different provinces of India, as well as for public institutions in Europe and America. The work of preparing these collections was entrusted to the Inspector General of Forests, with the assistance of Mr. J. S. Gamble and, during part of the time, of Mr. A. Smythies and Mr. D. P. Copeland. Collection for Paris Exhibition.

Workshops were established at Simla and Calcutta, and the collection for Paris was despatched in February 1878 in 125 cases and packages, containing upwards of 700 specimens of timber and a great variety of fibres, gums, resins, and other produce. No specimens were admitted which could not with certainty be identified, and one of the chief objects was to show together specimens of the valuable woods of India collected from as many different regions as possible, so as to form a series illustrating the different growths and different qualities in different climates. A series of Forest maps and publications of the Forest Department were subsequently added. Two gold medals were awarded at the Exhibition for these collections. The specimens sent to other institutions were despatched in 1878-79, and will be noted in the review for that year.

CHAPTER I.

RESERVED AND LEASED FORESTS.

AREA AND BOUNDARIES.

28. The following exhibits the area of the demarcated Reserves at the close of the year, as entered in the provincial reports :— Summary.

PROVINCES.	AREA OF RESERVED FORESTS ON	
	31st March 1877.	31st March 1878.
	Sq. Miles.	Sq. Miles.
Bengal	3,390	3,430
North-Western Provinces	2,568	2,360
Oudh	824	1,113
Punjab	3,782	3,791
Central Provinces	2,391	2,518
British Burma	640	650
Coorg	381	295
Ajmere	100	100
Assam	1,910	1,988
TOTAL	15,986	16,260
Mysore	419	442
Berar	1,400	1,402
GRAND TOTAL	17,835	18,113

No Reserved Forests notified under the new Act.

29. The Indian Forest Act came into force on the 8th March in the Bombay Presidency, in Bengal, the North-Western Provinces and the Punjab (except the district of Hazara), in Oudh, the Central Provinces, and Assam. As already explained, this Act establishes a classification of Forests somewhat different from that hitherto existing, the classes being "Reserved Forests," and "Protected Forests." With reference to Forests under the executive control of Government for purposes of Forest conservancy at the time the Act came into force, it was left to local Governments within twelve months from that date to declare, by notification, to which of these classes the Forests in the territories administered by them should belong. The action taken by Local Governments under this Act will somewhat modify the returns of Reserved Forests (briefly styled "Reserves") recorded in this and previous reviews; but no notification under the new Act was issued during the year under notice, and the areas here stated are those notified under the old Forest Rules. The meaning of the term "Reserved Forest" as explained in paragraph 2 of the review of 1873-74, has, however, not been materially altered by the new Act.

Forests notified in districts and provinces where the new Act does not apply.

30. In those districts and provinces under the Government of India to which the new Act does not at present apply, the Reserved Forests entered in the statement have been notified under the following rules :—

(1). *Punjab.*—In the Hazara district, "Reserved Forests" have been declared under a Regulation promulgated under 33 Vic., Cap. 3. In the rest of the province the new Indian Forest Act applies. The Punjab Forest Department has also charge of the Forests in the Native States of Chamba and Bashahr, which have been leased to the British Government for a long term of years. In virtue of the conditions of those leases certain areas have been demarcated and constituted "Reserved Forests."

(2). *British Burma.*—"Reserved Forests" have been constituted in this province under two sets of rules :—the Forest Rules of 1865, which were legalized by Act VII of 1869, and which apply to certain limited tracts of country only; and the Forest Rules of 1876 made under Act VII of 1865 and which were made applicable to a large extent of Forest not included in the area to which the rules of 1865 apply.

(3). *Coorg.*—"Government Forests" were declared and demarcated under the Coorg Forest Rules of 1871, made under the Government Forest Act of 1865.

(4). *Ajmere.*—"State Forests" were demarcated under the Ajmere Forest Regulation of 1874.

(5). *Mysore.*—"State Forests" were demarcated under the Mysore Forest Rules of 1869. These rules have since been revised, but the revised rules were not promulgated until after the close of the year.

(6). *Berar.*—"State Forests" were demarcated under the Berar Forest Rules of 1871. A revision of these rules is under discussion.

As explained in paragraph 11 of the review for 1876-77, there are two classes of Reserved Forests in Berar—the Reserved Forests in charge of the Forest officers, and the Reserved District Forests in charge of the Deputy Commissioners of districts: the former were formed under Rule 8, and the latter under Rule 37 of the Berar Forest Rules. But as both classes of Forests have been demarcated with the view of being permanently maintained as Forests, they are both properly shown under Reserved Forests.

Want of uniformity in the designation of Reserved Forests

31. It will be noticed that there exists as yet a certain want of uniformity in the nomenclature of the Reserved Forests in the different provinces, some being technically styled Reserved Forests, others District Reserves, State Forests and Government Forests. These discrepancies in the nomenclature were unavoidable in a new business, in the development of which it was good policy to leave a certain latitude to the views of local authorities. Now, however, since a general classification of Forests has been established by the Indian Forest Act, it will be expedient to adopt generally the designation established in that Act, also in those provinces to which the Forest Act has not been made applicable.

All Forests included in the statement recorded in paragraph 28 are practically Reserved Forests, that is they are reserved from sale, specially demarcated and intended to be permanently maintained as Forests.

32. The changes in the area of the Reserved Forests during the year under notice have not been considerable. In Bengal 12 square miles were added in the Jalpaiguri, and 28 in the Palamow Division. The demarcation of the Forests which have been declared Reserved Forests, that is, the clearing of boundary lines and the erection of substantial boundary marks, has kept pace in Bengal everywhere except in Chota Nagpore, where 460 square miles of gazetted reserves have not yet been demarcated. Besides these, only 8 square miles in the Darjeeling, and 18 in the Jalpaiguri, district remain to be demarcated; but a certain annual outlay on the maintenance and improvement of the boundary lines will still be necessary. The outlay on demarcation varies exceedingly under different circumstances. The demarcation of the Sunderban Forests, for instance, was a very simple and inexpensive proceeding, the boundaries being formed by creeks and rivers, and the boundary marks consisting of boards nailed to trees or posts erected for the purpose. There has been no clearing of lines, and there is no maintenance of cleared lines. In Chittagong most of the boundary lines run along ridges, but along these ridges it is not considered necessary at present to cut lines or to erect boundary marks. Progress of demarcation. Bengal.

33. In the North-Western Provinces a small addition has been made to the Jaunsar Forests, but the alterations in the figures are chiefly owing to the transfer of the Forests in certain districts which has been made between the charges of the two Conservators in Oudh and the North-Western Provinces, in consequence of the amalgamation of Government in these two provinces. In future reviews the Forests in Oudh and the North-Western Provinces will be included in one entry. North-Western Provinces and Oudh.

In Oudh considerable progress was made in better defining the boundary lines of the Government Forests; but much still remains to be done in the Forests of the Gorakhpur and Bareilly districts lately transferred to the charge of the Oudh Conservator. Good progress is reported to have been made in marking out the boundaries of the Government Forests in the Kheri and Bharaich Divisions by continuous ditches. This is an excellent move deserving imitation in other provinces which have Forests in the plains and under similar circumstances.

34. In the Central Provinces two important Forest tracts in the Nimar District have been added, *viz.*, the Chandgarh Forests, north of the Nerbudda river, measuring 61,440 acres, and the Khandwa Forest south of the river, between Punassa and Khandwa, measuring 35,840 acres. In these Forests Anjan (*Hardwickia binata*) is, besides teak, the most important tree. The timber of this tree is exceedingly hard and heavy, and on this account the tree has hitherto been spared, so that there are numerous mature specimens of large size left in these Forests. The timber is very durable, and will doubtless be found useful for Railway sleepers. Central Provinces

35. In Burma 68 square miles were added in the Tenasserim and 239 square miles in the Pegu Forest Circle, but on the other hand 297 square miles in the Thayetmyo and Prome districts of Pegu, which had in former reports been included in the returns without sufficient authority, were excluded, so that the increase of the total area only amounted to 10 square miles. Burma.

36. The area of the State Forests in Ajmere and Mhairwarra is 64,428 acres according to the Settlement and Forest Surveys, and this figure it has been decided to maintain for the present, though according to the topographical survey, the aggregate area is only 59,256 acres. Ajmere

37. In Assam, 72 square miles of Sâl Forests have been added to the Reserved Forests in the Duars of the Goalpara district. Remaining Provinces.

The alterations in the entries relating to the Punjab, Coorg, Mysore and Berar are due to corrections made in the areas during the year.

Outlay on demarcation.

38. The outlay charged in the accounts of the year for demarcation was Rs. 40,239 against Rs. 27,086 in 1876-77. On account of compensation for land and rights Rs. 6,531 were expended, against Rs. 7,894 in 1876-77. The additions made to the reserves in the year under notice amounted to 575 square miles, due allowance being made for the area excluded in Burma, while in 1876-77, 2,735 square miles were added. At first sight these figures would seem to disclose an abnormally high outlay in 1877-78, and not at all in proportion to the progress reported to have been made in demarcation. But the amounts charged under demarcation also include outlay incurred for the maintenance and improvement of the boundaries of existing reserves, as well as for the demarcation of new reserves. Again the work of selecting and demarcating a certain Forest necessarily demands time and often extends over several years, and during the year under notice much preparatory work was done in Bengal, British Burma and Assam, which increased the outlay under this head, without in proportion increasing the area added to the Reserved Forests.

Results compared in different provinces and successive years.

39. The following figures will serve further to illustrate what has been explained, and will show that the outlay incurred in the different provinces under these heads is not necessarily proportionate to the area declared as Reserved Forests during the year 1877-78 :—

Provinces.	Area added to Reserved Forests.	Outlay on demarcation.	Compensation for land and rights.	Total.
	Square miles	Rs.	Rs.	Rs.
Bengal	40	7,273	2,849	10,122
North-Western Provinces and Oudh	80	6,748	779	7,527
Punjab	...	8,361	487	8,848
Central Provinces	156	746	600	1,346
Burma	307	11,252	973	12,225
Assam	72	2,484	...	2,184

Similar results appear from the totals of the last three years :—

Years.	Area added to Reserved Forests.	Outlay on demarcation.	Compensation for land and rights.	Total.
	Square miles.	Rs.	Rs.	Rs.
1875-76	3,018	...	...	57,017
1876-77	2,746	27,086	7,894	34,980
1877-78	575	40,239	6,531	46,770

It will, however, obviously be necessary, that in future reports the nature of the outlay under this head should be more fully explained, and I would suggest that in each provincial report a comparative statement be entered, exhibiting the area added to the Reserved Forests during the last three years, and the outlay incurred upon demarcation and compensation for land and rights, and that these items be explained, so as to show approximately, as far as such is practicable, what outlay was incurred upon the maintenance and improvement of the

boundaries, upon the demarcation of the reserves declared during the year, and upon the preliminary work connected with the selection and demarcation of Forests that will be declared as Reserved Forests in subsequent years.

40. The amounts paid and charged in the accounts of the year for the rent of Leased Forests and to shareholders of Forests managed by Government were as follows :— Payments for rent of leased Forests.

North-Western Provinces (for lease of Forests in Native Garhwal)	10,883
Punjab (includes payments for the lease of the Forests in Bashahr, and Chamba, to shareholders in Kalesar, and half seigniorage of the Hazara Forests)	33,699
Assam	50
Berar (annual payment to Melghat Rajahs)	18,682
TOTAL	62,814

Of the Forests for which these payments were made, those in Hazara and the Melghat in Berar are completely demarcated, while in Chamba demarcation is in progress, and in Native Garhwal, Bashahr and Kalesar demarcation has not yet been commenced.

PROTECTION FROM FIRE.

41. Excepting Berar, where the total area protected was less than in previous years, there has been a satisfactory and steady increase of the fire protected area in all provinces. This will be seen by comparing the figures recorded in the following statement with those recorded in previous years :— Summary.

Area of Forests protected from fire in 1877-78.

Provinces.	Acres.	Total outlay from commencement.	Date to which expenditure has been incurred.	Year when fire conservancy commenced.
		Rs.		
Bengal	78,834	4,209	31st May 1878 ...	1876
North-Western Provinces...	243,143	39,662	30th June 1878 ...	1872
Oudh	101,515	12,538	Ditto ...	1872
Punjab	.....	.....	.....	.....
Central Provinces ...	575,304	77,363	30th June 1878 ...	1864
British Burma ...	68,198	44,919	Ditto ...	1868
Coorg	16,106	2,668	Ditto ...	1876
Ajmere	44,686	2,193	Ditto ...	1874
Assam	60,028	10,302	Ditto ...	1873
Total ...	1,187,814	193,854	.....	....
Mysore	58,880	12,312	30th April 1878 ...	1874
Berar	554,577	10,311	30th June 1878 ...	1870
GRAND TOTAL ...	1,801,271	216,477	.....	.....

As in previous years, the figures here recorded represent the area protected to the end of the dry season of 1878. In those provinces where the monsoon commences early, such as Assam and Bengal, the 31st May is a suitable date, while for the other Provinces it is found necessary to carry on the record to the 30th June, as there is often risk from fire up to that date.

Bengal

42. In Bengal, owing to exceptionally dry weather and the prevalence of storms of wind during the hot season, about one-third of the total area attempted to be protected was burnt over. Of the areas protected in 1877, the Sivok and part of the Muraghat Sâl Forests were burnt, but Bamunpokri, part of the Buxa Reserve, and Sitapahar in Chittagong, were protected. The Bholka Forest in the Western Duars was protected for the first time.

North-Western Provinces and Oudh.

43. In the North-Western Provinces and Oudh the *aggregate* areas should be compared with those of the previous year on account of the transfers made between the two charges which have already been explained. The figures stand as follows :—

	Area protected from fire in	
	1877.	1878.
	Acres.	Acres.
North-Western Provinces	301,330	243,143
Oudh	30,027	101,515
TOTAL ...	331,357	344,658

In the North-Western Provinces additions were made in the Sâl Forests of Kumaun and Garhwal, while areas previously protected were burnt in the Dehra Dun and Bijnor Divisions. In their orders on the Report for 1876-77 the Government of India observed that too much detail had been given in the fire protection statement of that year, and suggested that the summary only should be printed, provided the prescribed information were given in the summary. The Conservator has, however, omitted the names of the Forest tracts protected, so that this year's statement only exhibits the total areas protected in each Forest Division. A glance at the returns exhibiting the areas protected from fire in the Bengal, Oudh, Central Provinces and Assam Reports will show that it is not difficult to exhibit in a brief and compact return the areas protected in each Forest tract as prescribed by the Government of India, and the arrangement of the returns in the reports named may be recommended for adoption to the Conservator of the North-Western Provinces.

Punjab.

44. The Punjab is the only Province in which no special arrangements for protection against fires are needed. Fires are comparatively rare, although, when they do occur, they are very destructive.

Central Provinces.

45. In the Central Provinces the area protected from fire to the 30th June 1877 aggregated 504,824 acres. Unfortunately, some of the Forests included in this area, which had been continuously protected for some time, were burnt in 1878, among them part of the Banjar Valley Sâl Forest, of Saoligarh, Bori, Kalibhit and Bowergarh. In the Bori Forest, which had been continuously protected ever since 1864, 1,600 acres were burnt. On the other hand, large additional areas were protected in Rajaborari and Punassa, as well as in the recently demarcated Forests of Khandwa and Chandgarh. Altogether the protection of 702,310 acres was attempted, of which 575,304 acres were reported to be safe at the commencement of the monsoon of 1878. This is more than one-third of the total area of the demarcated reserves, which, on 1st April 1878, amounted to 1,631,200 acres.

British Burma.

46. In British Burma the Review for 1876-77, following the Provincial Reports, stated the area successfully protected as 70,792 acres. The present Report for the Pegu Circle, however, explains that the Gway Cho and Choungzouk reserves had been erroneously entered last year as successfully protected, and that their protection had not even been attempted. The area of these Forests aggregates 13,056 acres, and the area successfully protected in 1877 should therefore have been entered as 57,736 acres. Returns which contain mistakes like this are misleading and are obviously worse than useless.

During the year under notice the attempts made in fire protection have only been partially successful. The following figures give a summary of the result :—

	Protected in 1877.	Area in Acres attempted in 1878.	Protected in 1878.
	Acres.	Acres.	Acres.
Tenasserim Circle	27,360	45,450	30,634
Pegu Circle	30,376	38,765	37,564
TOTAL ...	57,736	84,215	68,198

The failures were considerable. In the Tenasserim Circle 14,496 acres in the Doomdameo Forests failed out of 21,760 acres, the protection of which was attempted. In the Pegu Circle the whole of the Kyetpyoogan and part of the Prome and Magayee plantations were burnt. Large sums of money have been expended upon these plantations, and great damage has been done by these fires. The cost of these operations during the year amounted to Rs. 468 in the Tenasserim Circle, which is very moderate, while in the Pegu Circle the outlay (Rs. 7,631) has been heavy.

47. In Coorg part of the Anekadu Forest was protected in 1877, and the Dubare Forest was taken in hand in 1878. The protection of 21,306 acres was attempted, of which area 16,106 acres were successful. Coorg.

48. In Ajmere the same area was protected as in previous years, *viz.*, 44,686 acres out of a total area of 64,428 acres. In these tracts, protection from fire has hitherto been comparatively easy, the land when taken up being almost bare, and there not being much inflammable material upon the ground. But as the growth in the protected areas gets thicker, the risk from fire during the dry season must increase for some years to come, and the greatest vigilance will be needed to guard against conflagration of the Forest that has sprung up upon the protected areas. Ajmere.

49. In Assam the area protected in 1877 was 59,290 acres. Excepting a portion of the Sidli Forest, this area was again protected in 1878, but large additional areas, the protection of which was attempted in the Sidli and Guma Forests, failed, so that out of 89,761 acres, the protection of which was attempted, only 60,028 acres were successful. These failures are attributed chiefly to the unusually dry season. But such unusually dry seasons are not uncommon in Assam, and in future it will be necessary so to organize the work of fire protection, that the Forests may be safe even during exceptionally dry seasons. Assam.

50. In Mysore the area successfully protected in 1878 is reported at 92 square miles or 58,880 acres, against 37,500 acres protected in 1877. This includes 16,640 acres in Lakvalli, 6,400 acres in Sakrebail, 5,760 acres in Shankar, 4,480 acres in Nundydroog, 1,920 acres in Bilikal, and 10,240 acres in the Devaraydurga Forest, which had all been protected in 1877. In addition to the areas protected during the previous year, 9,600 acres were saved in the Ainur Marigudi Forest and the protected area in Lakvalli was increased from 16,640 to 20,480 acres. On the other hand, the Begur Forest, a portion of which had been successfully protected in 1876 and 1877, was burnt in 1878. It is explained that this calamity was caused by the illness of the superior officer in charge, during whose absence the work was left in the hands of the Forest Ranger. The superior staff in the Mysore Forests has lately been considerably reduced, and there seems good ground to apprehend that it is not sufficiently strong to accomplish the work that has to be done. The total outlay upon fire protection in Mysore from the commencement has been Rs. 12,300, of which Rs. 5,500 were expended during 1877-78, and apart from the damage which is done if Forests are burnt, which have been protected for some time, it obviously is bad economy to expend large sums upon this work, when the superior agency for supervision is insufficient. Mysore.

Devaraydurga Forest.

51. The protection of the Devaraydurga Forest (10,240 acres), which has been continued during a long series of years, has been adverted to in the reviews of several years. The Conservator reports steady improvement in the condition of this Forest, and adverts particularly to the very satisfactory growth of young sandal-wood. From the time that this Forest was placed under the management of the Forest Department in 1866, until April 1878, the outlay incurred upon it, inclusive of establishments, has amounted to Rs. 11,280, against an income of Rs. 6,273, of which Rs. 3,345 were realized in 1877-78. The Conservator states that the income is improving, and that ere long every rupee spent on its conservation and improvement will have been repaid. This Forest is situated in the Maidan, or dry and open country; and Captain Van Someren justly draws attention to the necessity of protecting as many of the hill ranges in this part of the country as possible. He urges that they contain the sources of numerous small streams which feed rivers, and that they will, if cared for, produce large quantities of small wood, of fuel, and eventually of other forest produce, which will add to the comfort and well-being of the people. More than this, the conservation of these hill ranges, which, as the Conservator justly remarks, has been too much neglected, will largely increase the supply of grass and other cattle fodder, and will thus directly and immediately benefit the agricultural population. Without protection against fire, however, the improvement of these dry hills is not possible.

Berar.

52. In Berar 610,142 acres were protected in 1877, but only 554,577 acres were safe at the commencement of the monsoon of 1878. The chief failures were in two Forests situated in South Berar. In the Ghât Bori Forest, situated on the edge of the ghâts which bound the Poorna valley on the south, 16,000 acres were burnt out of 25,280 acres, the protection of which was attempted. The Chief Forest Officer explains that no less than twelve fires occurred during the hot season, and that these fires did not take place near a road, path, or in the proximity of cultivated land, but in the centre of ravines or on the slopes of hills, some distance inside the Forest, thus clearly showing that they were intentionally lit. This is not satisfactory. Of the Kinwat Forest, which is situated in the south-east corner of Berar on the Penganga river, no less than 36,500 acres or two-thirds of the Reserve were burnt during a strong gale of wind on the 20th April; the fire having been lit accidentally, the Ranger, instead of sacrificing a portion of the Forest by making counterfires, attempted to beat out the flames with branches. This mishap is much to be regretted; for during the two years that this forest had been successfully protected, the improvement had been very marked, seedlings having sprung up in numbers wherever there were seed-bearing trees and a fair depth of soil.

The Deputy Conservator states that 1878 was the most trying year in the matter of fire conservancy that has ever been experienced in Berar since regular Forest administration had been commenced, the rainfall in 1877 having been little more than two-thirds of its average amount, and the grass being therefore inflammable for a much longer period than usual, and this circumstance to some extent explains the less success attained in this respect during the year under notice.

Outlay.

53. The annual outlay on fire protection and the area protected each year by means of this expenditure will appear from the following figures:—

	Area protected.	Outlay.	Rate per 1,000 Acres.
	Acres.	Rs.	Rs.
1875-76	1,127,275	74,810	66
1876-77	1,686,760	51,416	30
1877-78	1,801,271	52,776	29
Total Outlay ...		1,79,002	

This is the outlay as it appears in the accounts of each official year.

The figures entered in the statements of fire-protected area recorded in the provincial reports give the outlay to the end of the dry season.

The total outlay from the commencement of fire conservancy to the close of the season was Rs. 2,16,477, of which Rs. 37,475 represents the expenditure on this account from 1864, when operations commenced in the Central Provinces, to 1st April 1875.

So much is apparent from these figures that the outlay on this account has not increased in proportion to the additional areas protected. This is easily explained, for as protection is continued the work is better understood and consequently done more economically, and moreover, as under the influence of continued protection the cover over head increases, the growth of grass is less, and protection becomes easier.

54. The outlay per 1,000 acres varies exceedingly in the different provinces, as will be seen from the following figures which give the amounts charged in the accounts of the official year. The figures recorded in the provincial reports include, it will be remembered, the outlay incurred to the end of the dry season :— Outlay varies in different Provinces.

		Area protected.	Outlay.	Rate per 1,000 Acres.
		Acres.	Rs	Rs.
Burma { Tenasserim Circle	...	30,634	341	11
Burma { Pegu Circle	...	37,564	8,798	234
North-Western Provinces	...	243,143	13,453	55
Central Provinces	...	575,304	10,254	18
Berar	...	551,577	2,522	5

The small outlay on this account in Berar, Tenasserim and the Central Provinces is satisfactory, while the heavy outlay in the North-Western Provinces and the Pegu Circle of British Burma requires notice. At first sight there appears to be no reason why fire protection in the Pegu Circle of Burma should be more expensive than in Tenasserim, nor are the circumstances apparent which in the North-Western Provinces justify an outlay of Rs. 55 on 1,000 acres, when in the Central Provinces the same work is done for Rs. 18 for the same area.

PLANTATIONS AND OTHER REPRODUCTIVE MEASURES.

55. Protection against indiscriminate cutting and the exclusion of fires have a most remarkable effect upon the growth of the Forests. In most provinces the Forests, when first taken in hand by the Department, were poor and open ; they consisted of scattered trees with extensive blanks, and the majority of the trees themselves were badly grown, unsound and hollow. The great effect of protection against indiscriminate cutting and of the exclusion of fires has been that the Forest has filled up; the old trees have obtained a new lease of life, they have thrown out fresh branches, their foliage has become thicker and the formation of wood more rapid. Coppice shoots have sprung up everywhere from the numerous stumps and underground masses of wood which are found in all land formerly stocked with Forest. Coppice shoots were produced annually from these underground stumps and roots in unprotected Forests also, but the shoots were either cut, or burnt down by the annual jungle fires. Seedlings have sprung up in abundance and the old blanks are now occupied by thickets of saplings. Where protection has been continued during a sufficient length of time, saplings grow up into poles and young trees. Instead of charred stems and burnt bark, and the wood exposed to the action of fires, it is pleasant to see the smooth, clean and healthy bark of saplings and poles, and to know that the wood protected by the sound and healthy bark will, as a rule, attain maturity without hollows and blemish. The soil, which formerly was bare and hard, deteriorating annually instead of improving, is gradually enriched by the decaying leaves, becomes loose and open, absorbs more moisture and gives access to the air. In the deciduous Forests which form a large proportion of the Forests under the management of the Department, the leaves remain upon the trees much longer into the hot season, and under the denser and longer continued shade the soil remains moist, and in consequence vegetation is more vigorous. The trees and bamboos attain a larger size and their growth is more rapid. Beneficial effect of fire protection.

56. All these are great and important advantages which have been gained by steadily persevering in the protection of the Forests against cutting and fires. It may be said that under the operation of these measures the condition of the Forests as a whole has improved, and that they are in a fair way of becoming Measures to increase the proportion of the more valuable kinds

well and completely stocked. More however than this is required. In the Forest which grows up under protection, the valuable kinds of timber are often scanty or not in sufficient numbers; hence planting and other cultural operations must be resorted to in order to increase the proportion of the valuable kinds in the Forest.

The difficulty in Forest management in most districts is that fuel is not saleable, and that the only article which is saleable is timber for building and other purposes. Marketable timber is yielded only by certain kinds of trees; and when a Forest is worked, these are necessarily cut out, and the less valuable kinds remain. Hence planting and other cultural operations must be resorted to in order to ensure the regeneration of the Forests with the desired proportion of trees of the more valuable kinds.

Planting operations are also necessary when it is intended to re-clothe barren tracts with Forest, or to raise Forest where formerly none existed.

Distinction between plantations and works of reproduction

57. It will be obvious that these cultural operations must adapt themselves to the peculiar circumstances of each case. In certain circumstances they will be spread over large areas of Forest, while in others limited areas are taken in hand upon which the work is concentrated. Broadly speaking, plantations may be distinguished from works of reproduction, but this distinction cannot in all cases be sharply maintained. Planting and sowing forms a more or less important element in most cultural operations, which have for their object the regeneration of the Forest. It will therefore be convenient to deal with all these matters in one section of the annual Review.

As a rule we may expect that natural reproduction will be the most important method of regenerating our Forests in India; but what has been stated will serve to explain that natural reproduction must be aided by cultural operations, when it is intended to increase the proportion of certain more valuable kinds of trees, or when, owing to unfavourable conditions of climate, soil, situation, or the want of sufficient growing stock to shed seed or to produce coppice shoots, the regeneration of a Forest would otherwise be slow and imperfect. Again, it will be understood, that plantations are necessary, whenever it is proposed to form new Forests in places where formerly no Forest existed.

Summary.

58. *Area of plantations in* 1877-78, *and extensions made during the year.*

Provinces.	Area.				Expenditure.		
	At the commencement of the year.	Added during the year	Excluded during the year.	At the close of the year.	Previous.	During the year.	Total.
	Acres	Acres	Acres.	Acres.	Rs.	Rs	Rs.
Bengal	526	111	..	637	53,320	11,428	64,748
North-Western Provinces...	1,685	18	47	1,656	24,575	1,867	26,442
Oudh	245	20	...	265	4,311	168	4,479
Punjab	13,810	1,610	..	15,420	6,24,501	75,754	7,00,255
Central Provinces ...		..	...	..	...		..
British Burma ...	3,066	273	...	3,339	2,58,056	18,509	2,76,565
Coorg	396	..	...	396	25,269	1,529	26,798
Ajmere	368	...	..	368	20,909	2,789	23,698
Assam	620	151	...	774	23,336	6,882	30,218
Total ...	20,716	2,186	47	22,855	10,31,277	1,18,926	11,53,203
Mysore	3,501	...	...	3,501	1,02,983	13,031	1,16,014
Berar	1,441	8		1,449	32,348	5,460	37,808
Total ..	4,945	8	...	4,953	1,35,331	18,491	1,53,822
Grand total ...	25,661	2,194	47	27,808	11,69,608	1,37,417	13,07,025
Deduct revenue	..	...	...	...	69,466	11,746	81,212*
Net outlay on plantations ...	...	...	..	...	11,00,142	1,25,671	12,25,813

* In the Punjab the revenue realized from plantations during the year was Rs. 11,746, and from the commencement Rs. 81,212. No revenue is recorded as realized from plantations in other provinces.

The foregoing statement exhibits the area of the plantations at the commencement of the year and the extensions made during the year. But in the case of the following provinces the figures representing the area and cost at the commencement of the year do not agree with the figures entered for the same date in the returns for 1876-77.

North-Western Provinces.—The area at the close of 1876-77 was 1,983 acres, upon which Rs. 28,883 were said to have been spent. But the return for 1877-78 opens with an area of 1,930 acres, and the expenditure is altered to Rs. 28,886. This is caused by arithmetical mistakes in the return for 1876-77, and by the omission from the return for 1877-78 of 29 acres of plantations in Koti (Jaunsar Division).

The figures here entered in the statement are further altered to 1,685 acres at the commencement of the year, and the expenditure to Rs. 24,575, by deducting 245 acres of plantations in Gorakhpur on which Rs. 4,311 were spent, and entering them under Oudh, to which Circle the Gorakhpur Forest Division was transferred during the year.

Punjab.—The return has been revised, and exhibits on the 1st April 1877, 13,810 acres, on which Rs. 6,24,501 were expended, instead of 13,846 acres on which Rs. 6,34,364 were expended on the 31st March 1877.

Coorg.—The area and cost shewn in the return for 1876-77 have been reduced from 470 acres on which Rs. 27,657 were spent, to 396 acres on which Rs. 25,269 were expended.

Ajmere.—The return has been revised, and now shews, on the 1st April 1877, 368 acres, on which Rs. 20,909 have been expended, instead of 310 acres on which Rs. 6,960 were expended, as shewn in the Report for 1876-77.

Mysore.—The area and cost of plantations on the 1st April 1877 have likewise been altered from 3,902 acres at a cost of Rs. 1,29,581, to 3,504 acres at a cost of Rs. 1,02,983. The revised figures of both Coorg and Mysore are stated to represent only those areas which were completely stocked.

59. In Bengal the additions made consisted of 60 acres in Bamunpokri, chiefly stocked with Teak and Toon, 34 acres of Sal in Buxa, and 14 acres of Teak in Sitapahar. In paragraph 54 of his report, the Conservator explains that certain forests in the Darjeeling Division in the vicinity of the cart road had been cleared of almost all good trees, whereas the inferior trees had remained on the ground, and that under these circumstances it became necessary to make a clean cut of the area in question, and to plant it up again artificially. The Rungbur plantation in the Darjeeling Division was established in order to commence the re-stocking of this area. The extent of the plantation is 144 acres, and it had to the close of the year cost Rs. 14,020. It was planted in the years 1868 to 1871, as described in the Bengal Forest Report for 1872-73; and owing to the difficulty experienced in keeping out cattle, it had to be fenced in 1874. The heavy expenditure on this fence, as well as the cost of making nurseries for planting adjoining blocks—which planting was begun in 1878-79—have largely contributed to swell the outlay. There is no doubt but that it will be necessary to depend largely on artificial growth to supplement the natural reproduction of the hill forests which, although very good as regards some species, such as the maple, is not satisfactory in the case of the oak and magnolia. Thus it is evident that it will be necessary to devise means for reducing the cost of these operations, and they will doubtless be less expensive in future. Bengal.

60. In the Punjab Report the return (No. 46) consists of two portions, the area in the Plantation Division, and that in other divisions, the totals being as follows :— Punjab.

	On 1st April 1877.		During 1877-78		On 31st March 1878.	
	Area. Acres.	Cost. Rs.	Area added. Acres.	Cost. Rs.	Total area. Acres.	Total cost. Rs.
Other Divisions ...	1,481	13,497	1,486	4,114	2,967	17,611
Plantation Division ...	13,810	6,24,501	1,610	75,754	15,420	7,00,255
Total ...	15,291	6,37,998	3,096	79,868	18,387	7,17,866

The balance on 1st April 1877 given in the second line corresponds nearly, though not entirely, to the balance recorded in the Report for 1876-77, and the areas in the Plantation Division alone have therefore been entered in the general return of this Review. Some of the operations recorded under "Other Divisions" are more of the nature of operations undertaken to aid natural reproduction, though others may perhaps be classed under plantations. As already explained, a sharp line between these different classes of work cannot be drawn, and under these circumstances it appears best, for the present, only to include the areas in the Plantation Division in the return of the present review.

Net outlay.

61. In paragraph 159 of the Report the revenue realized in the Plantation Division during the five years 1873-74 to 1877-78, is stated; it amounted in the aggregate to Rs. 81,212, that for 1877-78 being Rs. 11,746. The net outlay as entered in the accounts of the year has therefore been :—

	Outlay.	Receipts.	Net Outlay.
From the commencement to	Rs.	Rs	Rs.
31st March 1877 ...	6,24,501	69,466	5,55,035
During 1877-78 ...	75,754	11,746	64,008
Total 31st March 1878 ...	7,00,255	81,212	6,19,043

The extensions are entered as 1,610 acres, but from what is stated in the Report it seems doubtful whether the whole of this area may be regarded as fairly stocked. The cost of maintenance is stated to have been Rs. 16,647, and the cost of extension Rs 34,710, but as the sum of these two figures is only Rs. 51,357, and the total expenditure of the Plantation Division having been Rs. 75,754, no reliable conclusions can be formed regarding the cost of maintenance and extension per acre during the year under review.

Accepting the area entered in the return as stocked on 31st March 1878, *viz.*, 15,420 acres, the net outlay up to that date had been Rs. 40 per acre.

Changa Manga

62. In Changa Manga 960 acres were planted, *viz.*, 660 acres with sissu, and 300 acres with sissu and mulberry in alternate lines. The total area of 960 acres is entered in the return, but in paragraph 86 it is stated that 107 acres failed, and that a nursery of *Tamarix articulata* had been made to replenish these blanks. Apparently 853 acres only should have been entered in the return for 1877-78. 1,150 acres were thinned, of which 462 acres were ten years old, the rest being, with the exception of a few acres of eight years, five years old. They yielded 22,978 maunds of saleable thinnings, or at the rate of 20 maunds per acre.

Under-wood of mulberry under sissu.

63. The Conservator notices the natural spread of mulberry as an undergrowth under sissu in Changa Manga as well as in other plantations in the Punjab, and adds that thinnings are expressly carried out to favour this growth. This remarkable feature of the sissu plantations in the Punjab was first noticed by the writer of the present Review in 1876, on an island in the Jhelam river below the station of Jhelam. A sissu Forest raised by planting about 1855 was first inspected by him in 1870, and then the ground under the sissu trees was bare. In 1876 the ground in the same Forest was found covered with a dense undergrowth of mulberry resembling an underwood of beech in an oak Forest. The change was so remarkable that enquiries were made whether the mulberry had been planted. This was not the case, it had sprung up naturally, the seed having spread chiefly by the aid of birds from a few trees which were accidentally mixed with the sissu in the plantation. The explanation is simple; the foliage of sissu is open, and admits much light on the ground, thus favouring the growth of young mulberry, while seedlings of sissu have no chance under the shade of a well-stocked sissu Forest. The undergrowth of mulberry in a sissu Forest is beneficial, as it enriches the soil and tends to keep it moist and cool.

Operations to aid natural reproduction

64. Among the operations to aid natural reproduction undertaken by the Conservator, the work commenced in the Pabbi Rakh, Gujrat district, merits special mention. This rakh has been completely demarcated, and also an inner or strictly closed portion of the same, situated on both sides of the railway line,

on dry stony hills, intersected on all sides by ravines and torrents. The work during the year was extended over 1,300 acres, at a cost, inclusive of fencing, of Rs. 1,065. It consisted in careful protection of all natural growth, in sowing and transplanting *Dodonæa* and *Acacia modesta* in plots, in treating the worst ravines with fascines, small dams, and dykes, and in sowing and planting the silt beds formed above them.

Systematic operations were also undertaken for the improvement of certain selected rakhs in the Lahore and Gujranwalla districts.

In Kulu good progress was made in sowing and planting Deodar, and thus filling up blanks in the demarcated reserves.

65. In Burma the only extension made during the year consisted of 273 acres sown with teak in the Magayee Forest in Pegu. The total area artificially stocked with Teak in this Forest is 1,306 acres, upon which Rs. 93,947 have been expended, which is at the rate of Rs. 72 per acre. Burma.

In addition to the plantations made by departmental agency, numerous plots in the Forest are sown with Teak on land cleared for Toungya or temporary hill cultivation. 84 acres of fresh Toungya Teak plantations were made in Tenasserim, and 211 acres in Pegu. These plantations are much less expensive than those made by the Department; and if properly guided, the system of Toungya plantations is destined to become the most important measure for increasing the Teak producing area in these Forests. In the Tenasserim Circle the Toungya Teak plantations are reported to aggregate 347 acres with an average of 200 plants per acre, and their cost from the commencement has been Rs. 2,344, or only Rs. 6-12 per acre.

Considerable areas have been operated upon in the Pegu Circle by sowing Teak seed in the Forest. Mr. Ribbentrop reports that Teak seed was dibbled in over about 2,000 acres in fire traced reserves, in places where the bamboo had flowered, or where trees of inferior kinds had been girdled during the previous year. Owing chiefly to the heavy growth of weeds, grass, and coppice shoots, the success of these operations is doubtful, and it seems probable that Toungya Teak plantations will be found to be preferable.

66. In Assam the area planted at the commencement of the year was 620 and at the close 774 acres. The additions were 11 acres in the Kulsi Forest, Kamrup district, and 143 acres in the Charduar Forest of the Darrang district. Both extensions were stocked with Caoutchouc. The total outlay incurred upon plantations in this province from the commencement has been Rs. 30,218, or Rs. 39 per acre. Assam.

67. In the Berar Report for 1876-77, the return of plantations closed with 1,441 acres; but the return in the report under notice opens with 2,528 acres, which Mr. Drysdale explains is the total area of plantations formed by the Department, and closes with 1,449 acres, which is stated to be the area completely stocked. This last figure represents the area which, under the orders of Government, should be entered, and the opening balance of the report under notice is not correct. The difference between 1,441 and 1,449 acres must not be regarded as an addition to the completely stocked area, but as a discrepancy in the figures of the return, which is not explained; the closing balance of 1,449 acres does not include the areas operated upon in 1877-78, *viz.*, 260 acres in the Bairagarh reserve and 200 acres in Kinwat, sown with Teak and bamboos in lines, the lines being at a distance of 33 feet, and the plots in the lines being 4 feet apart. The Deputy Conservator states that he had received most favourable reports regarding the success of these plantations, but it is proper not to include them in the area entered as stocked at the close of the year, until they have stood the test of the first hot season. Berar.

The total cost of the area fully stocked (1,449 acres) has been Rs. 37,808, amounting to Rs. 26 per acre.

68. Owing to the exclusion from time to time from the returns of areas found to be imperfectly stocked, and owing to the different views taken by different officers regarding the area and outlay which should be included in the General Remarks.

returns, there is still a certain want of uniformity in the plantation returns from different provinces. But the figures of the last three years fairly admit of comparison, and they are as follows :—

	Area stocked.	Total net outlay from commencement.	Rate per acre.
	Acres.	Rs.	Rs.
31st March 1876	23,167*	10,56,419*	45
" " 1877	25,661	11,00,142	43
" " 1878	27,808	12,25,813	44

The average cost of plantations per acre in most districts is as yet exceedingly high, but it must be remembered that the outlay on this account covers the cost of experiments, and that as more experience is gained the outlay on these operations will steadily diminish.

Cost of plantations compared with cost of fire protection

69. It is here the place to compare the annual cost of fire protection with the interest upon the capital outlay expended upon the existing plantations. Assuming the rate of interest at 5 per cent., and taking Rs. 40 as the average capital outlay per acre on plantations, and Rs. 28 as the annual cost of protecting 1,000 acres of Forest against fire, we obtain the following results :—

Average cost per 1,000 *acres per annum.*

	Rs.
Fire protection	28
Plantations	2,000

In order to make the comparison complete, the cost of maintenance and general protection should be added. The data however for making a reliable calculation, applicable to all provinces, are not available.

In considering these rates, it must be borne in mind that they represent data so heterogeneous that they hardly admit of averages being drawn from them. The present remarks are made more with the view of directing the attention of Forest Officers to the subject. When plantations and other cultural operations are undertaken on a large scale, it will be well to compare the interest on the capital outlay incurred upon such operations with the cost of protection including the exclusion of fires.

FOREST SURVEY.

Original surveys

70. The work accomplished comprises, *first*, original surveys of Forests, *second*, the preparation of Forest maps from existing materials, and *third*, the instruction of Junior Forest Officers in the theory and practice of surveying. As regards original surveys, considerable progress was made in the survey of the submontane Forests of Garhwal and Kumaun, including a portion appertaining to the civil district of Bijnor in the North-Western Provinces.

Maps.

71. A large number of maps was prepared from data furnished by other surveys and Conservators of Forests. The chief of these were :—maps showing the Forests between the Irawaddi river and the Yomah range in the Thayetmyo, Prome, and Tharawaddi Districts of Pegu ; maps showing the boundaries of demarcated reserves in the Central Provinces and Berar, and maps showing the Reserved Forests of Ajmere and Mhairwarra.

Instruction of Junior Officers

72. Three junior Forest Officers from other provinces who had for some time been attached for instruction to the Forest Survey, Messrs. Jellicoe, Down and Stewart, received certificates of qualification in surveying by the higher standard.

* These figures are taken from the Review of 1876-77 ; all the others from the present Review. The receipts on account of the plantations in the Punjab have in all cases been deducted, and the outlay here stated represents net outlay only.

Outlay on demarcation and improvement of Forests.

73. The outlay during the year on demarcation, protection and improvement of the Forests, including plantations, as recorded under the head AVIII, has been as follows. This, it will be remembered, does not include any establishment charges :— Outlay on demarcation and improvement of the Forests.

	Demarcation, improvement and extension of Forests—AVIII.						
	Demarcation.	Compensation for land and rights.	Surveys and working-plans.	Plantations.	Protection from fire.	Other works.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Bengal ...	7,273	2,849	269	11,429	1,826	248	23,894
North-Western Provinces...	2,745	636	616	1,473	13,453	8,146	27,069
Oudh ...	4,003	143	49	13	3,464	1,120	9,093
Punjab ...	8,361	487	3,109	47,636	159	7,712	67,464
Central Provinces ...	746	600	814	3,530	10,253	4,177	20,120
British Burmah ...	11,252	973	1,869	24,292	9,139	4,648	52,173
Coorg ...	492	...	286	1,659	1,989	...	4,426
Assam ...	2,484	...	2,196	6,885	3,738	889	16,192
Ajmere ...	3	...	...	2,929	230	2,521	5,683
Surveys ...	...	...	6,998	...	...	...	6,998
Total ...	37,359	5,688	16,206	99,846	44,251	29,761	2,33,112
Mysore ...	1,851	24	...	16,826	6,003	...	24,704
Berar ...	1,030	820	...	5,129	2,522	349	9,850
Grand Total ...	40,240	6,532	16,206	1,21,801	52,776	30,110	2,67,666

Communications and Buildings.

74. The outlay for communications, buildings and other works, charged in the accounts of the year has been as follows :— Summary.

Provinces.	Communications—AVII.			
	Roads and bridges.	Buildings.	Other works.	Total.
	Rs.	Rs.	Rs.	Rs.
Bengal	2,890	2,216	...	5,106
North-Western Provinces	32,608	3,443	35	36,086
Oudh	8,499	11,775	2,598	22,872
Punjab	7,542	13,772	593	21,907
Central Provinces	772	2,336	1,748	4,856
British Burmah	2,507	5,523	2,562	10,592
Coorg	35	213	...	248
Assam	1,144	6,705	22	7,871
Ajmere	221	736	...	957
Surveys	...	...	...	...
Total ...	56,218	46,719	7,558	1,10,495
Mysore	514	1,491	...	2,005
Berar	32	1,182	70	1,284
Grand Total ...	56,764	49,392	7,628	1,13,784

75. The outlay in Bengal has been very moderate, and yet much has been done for improving communications and to provide shelter in the Forests for officers and subordinates. Fifty-five and a half miles of new roads have been made in the Kurseong, Buxa and Chittagong Divisions, 63 miles of old roads repaired, and 250 miles of boundary paths cleared; 12 houses for subordinates and revenue stations have been erected or completed and 23 boats for the use of the Sundarbans Division have been built. Bengal.

North-Western Provinces and Oudh.

76. In the *North-Western Provinces* the outlay on this account has been very heavy, but the Conservator's report does not give sufficient information regarding the works upon which this money was expended. In the Kumaun Division two cart-roads aggregating nine miles are mentioned, as well as a number of bridle-paths along fire-lines, and in the Jaunsar Division a number of bridle-paths as well as the extension of the canal slide adverted to in last year's Review.

In *Oudh* the Conservator reports that over 400 miles of old roads and lines were kept in order, that 40 miles of new roads were made, and that 35 miles more are in hand. Progress is also reported in completing rest-houses and wells, and in making and preparing materials for new ones. The Soheli river, which is used for the export of most of the timber cut in the Khairigarh Forests, was cleared of snags.

Punjab.

77. Good progress in this respect is reported from the *Punjab*, the chief work having been a low level road up the Kaghan valley at a cost of about Rs. 8,000, part of which was paid by the sharers in the Forest contributing to the work one-fourth of the seigniorage due to them.

Central Provinces.

78. The most important work recorded in the annual Report of the *Central Provinces* is the improvement of the Banjar river in the Mandla District for the purpose of floating timber. When this work is completed, it will be possible to bring to Jubbulpore at remunerative rates the Sal timber of some of the best Forests in the Mandla District.

Burma and Assam.

79. In *Burma* the construction of three Forest rest-houses in the Tenasserim Circle, and four in the Pegu Circle, is reported.

In *Assam* a number of excellent houses for the accommodation of officers and subordinates have been built in the principal Forest Districts.

CHAPTER II.

MANAGEMENT OF GOVERNMENT FORESTS NOT INCLUDED WITHIN RESERVED FORESTS.

Unreserved or Protected Forests.

Genera

80. In those provinces in which the new Indian Forest Act is in force the Forests hitherto designated as "Unreserved Forests" will in future be known under a different designation, but the essential difference remains, that the Reserved Forests are demarcated to be permanently maintained as Forest, while the area of the unreserved forests is partly available for the extension of cultivation.

Central Provinces.

81. In the *Central Provinces* the area of the Unreserved Forests was increased from 16,444 square miles in the beginning, to 16,952 square miles at the close of the year. The principal changes were the inclusion of 152 square miles under Reserves in the Nimar district, the leasing out for ten years of 33 square miles in the Balaghat district, and the addition in the Sambalpur district of 695 square miles of Government waste-lands taken under management as Unreserved Forests. The change of system in the management of the Unreserved Forests in the Central Provinces has been adverted to in paragraph 22. These Forest lands are the absolute property of Government, and under the new Forest Act they have accordingly been gazetted as Reserved Forests. This, however, properly appertains to the Review of 1878-79.

Berar.

82. In *Berar* the area of the Unreserved Forests has remained unchanged. In the reports of former years, the revenue realized by the export of teak and other produce from these Forests was detailed, and the results are recorded

in paragraph 40 of the Review for 1876-77. The report for 1877-78 does not contain these data. It is desirable that they should be supplied in future reports, as the account of the material exported is, according to the nature of the produce, expressed in numerous units of measurement such as "Karass" (dragging loads), "Bullock loads," "Head loads," "Cart loads," &c., which arrangement obviously does not admit of totals being given.

CHAPTER III.

Protection of Government Forests.

83. The following figures give an abstract of the prosecutions, convictions and acquittals in the provinces to which this Review relates, during the five years since 1873-74:— Gradual increase of offences brought to trial.

YEAR.	Number of persons.			
	Prosecuted.	Convicted or under trial.	Acquitted.	Percentage of acquittals on prosecutions.
1873-74	2,730	2,313	489	18 per cent.
1874-75	3,066	2,688	378	12 „
1875-76	4,833	4,310	523	11 „
1876-77	5,009	3,817	1,192	23 „
1877-78	5,419	3,906	1,513	28 „

84. The number of prosecutions has doubled since 1873-74. To some extent this result is due to the increased area of demarcated Forests which at the close of 1873-74 aggregated 10,003 square miles, while on the 1st April 1878 it amounted to 18,113 square miles. Thus in Bengal, which had only 119 square miles of demarcated Forests in 1874, only nine persons were prosecuted in 1873-74, while in 1878 the area was 3,430 square miles, and the number of persons prosecuted 176. But upon the whole it cannot be said that in the different provinces the increase of prosecutions for Forest offences has been proportionate with the extension of the demarcated Reserves. Attention has already been drawn in previous Reviews to the circumstance, that in the Central Provinces prosecutions in the Unreserved Forests are more numerous than in the demarcated Reserves. This has also been the case during the year under review. There were 64 cases involving 171 persons in the Reserved, and 218 cases involving 397 persons in the Unreserved Forests. Causes of increase.

85. Speaking broadly, the increased number of prosecutions is due to the more efficient protection of the Forests. On the other hand, the practice of permitting persons to pay enhanced rates for produce removed without authority is now frequently adopted, and diminishes the number of prosecutions. As already explained, this practice is now legalized by section 67 of the Forest Act, and will, it may be hoped, be generally adopted wherever practicable. Chief cause—more efficient protection of the Forests.

As in previous years, the proportion of acquittals to prosecutions is very large in Bengal (72 per cent.) and in the Punjab (43 per cent.) In Assam also the proportion of acquittals was large, *viz.*, 53 per cent.

Summary

86. The following statement shows the number of prosecutions for breaches of Forest Rules during 1877-78 in the different provinces :—

PROVINCES.	Number of persons.		
	Prosecuted.	Convicted or under trial.	Acquitted
Bengal	176*	49	127
North-Western Provinces	639	479	160
Oudh	140	125	15
Punjab	1,618†	916	702
Central Provinces	568	498	70
British Burma	202	163	39
Coorg	1	1	.. ..
Ajmere	468	353	115
Assam	34	16	18
Total ...	3,846	2,600	1,246
Mysore	892	748	144
Berar	681	558	123
Grand Total ...	5,419	3,906	1,513

* Includes a balance of 115 from last year.
† Eighty-four cases pending.

The changes in Forest legislation made during the year have already been noticed under "Summary of Administration."

CHAPTER IV.

Yield and Financial Results.

General results

87. Statement I exhibits as usual the revenue and expenditure of the year in the provinces under the Government of India (not including the Presidencies of Madras and Bombay) classified under the prescribed heads. No general attempt has yet been made in the provincial reports to effect an intelligent allotment of the expenditure of the year under the three great heads: (1) outlay on timber and other produce removed on Government account, (2) on timber and other produce removed by purchasers, and other revenue, and (3) on the formation, protection and improvement of the Forests; and it has therefore again been necessary in the following statement to make a summary allotment of the expenditure. Consequently the results of this statement can only be regarded as a rough approximation. They would be more valuable if the statement was based upon an intelligent analysis of the annual figures in each province :—

PARTICULARS.	Receipts.		Charges.	
	Amounts.	Budget heads.	Amounts.	Budget heads.
	Rs.		Rs.	
1. Timber and other produce removed on Government account.	29,61,346	I	15,57,591	I, ½ of VI, ¼ of B.
2. Timber and other produce removed by purchasers, and other revenue.	26,14,795	II, III, IV, V	5,71,926	II, III, IV, IX, ½ of VI, ¼ of B.
3. Formation, protection and improvement of the Forests.	.....	.....	10,70,658	V, VII, VIII, ½ of B.
Total .	55,76,141	.....	32,00,175	

88. The average revenue realized and charges incurred on account of timber brought to depôt by Government agency have been as follows during the last five years :— Receipts and charges on account of Government timber operations.

Years.	Receipts.	Charges.
	Rs.	Rs.
1873-74	28,60,000	17,00,000
1874-75	24,34,000	19,16,000
1875-76	35,00,000	16,43,000
1876-77	27,00,000	18,20,000
1877-78	29,61,000	15,58,400
AVERAGE ...	28,91,000	17,27,400

Considering that in this statement the Government timber operations are debited with their full share of establishment and other charges, the result is not unfavourable.

89. The remaining Forest revenue consists of the following amounts :— Other Forest revenue.

	Rs.
Timber removed by purchasers	21,23,537
Confiscated drift and waif wood	85,248
Revenue from Forests not managed by Government ...	2,87,678
Other revenue	1,18,332
TOTAL ...	26,14,795
And the charges debitable to this revenue amount to ...	5,71,926

During the last five years the average receipts and charges on account of the other sources of revenue have been as follows :—

Years.	Receipts.	Charges.		
		A. Conservancy and Works.	B. Establishments.	Total Charges.
	Rs.	Rs.	Rs.	Rs.
1873-74	24,90,000	1,47,146	2,52,854	4,00,000
1874-75	24,53,861	2,26,271	2,50,734	4,77,005
1875-76	22,73,791	2,55,668	2,67,190	5,22,858
1876-77	23,81,331	2,61,486	2,95,761	5,57,247
1877-78	26,14,795	2,58,729	3,13,197	5,71,926

90. As regards Forest revenue generally, there has been no considerable development during the five last years for which actual figures are available, although during the last fourteen years the increase has been considerable. Dividing that period into three portions the average annual figures are as follows :— Gradual increase of gross Forest revenue.

	Rs.
1864-65 to 1867-68 (four years)	24,21,311
1868-69 to 1872-73 (five years)	37,31,516
1873-74 to 1877-78 (five years)	53,31,2[illegible]

It will be understood that these figures do not comprise the Presidencies of Madras and Bombay.

91. To the reviews of the three last years a statement was appended exhibiting the quantities of timber, wood and bamboos brought to depôt and sold on account of Government. In paragraphs 53 to 58 of the Review for 1876-77 it was explained that it would be well if in the provincial reports an attempt were now made to express all main Forest produce (timber, wood Yield in material.

and bamboos) in cubic feet, and all minor produce in weight and money value. When these suggestions are acted upon, and certain units of weight and measurement have been adopted in the provincial reports, and when the quantities or value of the produce removed by purchasers are ascertained and recorded, then it will be possible to compile useful statements, showing the yield in material of the Forests in the different provinces. This is not, however, the case at present, and hence no statement corresponding to that appended to previous Reviews has been given.

Export of Forest produce beyond India

92. The exports of Forest produce from India during the year under review have been as follows:—

	Quantity in tons of 20 cwt. In the case of teak 50 cubic feet.		Valuation at port of shipment in 1877-78.	
	Average of 7 years 1870-71—1876-77.	In 1877-78.	Total.	Per ton.
			Rs	Rs.
1 Caoutchouc ...	725	757	9,03,884	1,194
2. Shell-lac ...	3,760	3,943	28,50,552	723
3. Lac-dye .	765	479	2,90,087	605
4 Sandalwood, ebony and other ornamental woods.	(Not	known.)	3,68,217	(Not known.)
5. Cutch and Gambier ..	11,433	9,699	18,17,489	188
6. Myrobalans ...	(Not known.)	26,852	23,05,268	86
7. Teak ...	45,898	57,559	40,91,534	73

Myrobalans.

93. The demand for myrobalans (the fruit of *Terminalia Chebula*) is still on the increase. The quantities exported and their estimated value during the last three years have been—

	Tons.	Rs.
1875-76	14,317	10,64,013
1876-77	17,925	13,50,254
1877-78	26,852	23,05,268

It is believed that the demand for this tanning material has to a great extent been stimulated by the late war between Russia and Turkey which has injured the trade in *Vallonea* and *Galls* from Asia Minor and Syria. Vallonea or Vellani are the large acorn cups of *Quercus Ægilops*, a species of oak with grey leaves, which inhabits the Eastern Mediterranean region, particularly Asia Minor and Syria. The galls of the Levant are chiefly found on *Quercus infectoria*, the dyers' oak, a shrub or middle-sized tree. But galls are also yielded by other species of oak and are exported from Hungary and other countries of South and Middle Europe.

Myrobalans from the Ghat Forests in Kanara and Belgaum

94. Large quantities of myrobalans have of late years been exported from the Forests above-ghât in Belgaum and North Kanara, under excellent arrangements made by Major Peyton, the Conservator of Forests of the Southern Division of the Bombay Presidency, who has organized a regular system of employing the people inhabiting the Forests in this work. The revenue realized by him from this source is considerable, and he has gained the further advantage of protecting the Forests along the ghâts from fire, as the people engaged in collecting these myrobalans find it advantageous to maintain a regular system of fire conservancy. During the seven years from 1870-71 to 1876-77, the right to collect myrobalans in North Kanara and Belgaum sold on an average for Rs. 24,883 per annum, and in 1877-78 the departmental collection gave a net revenue of Rs. 76,966.

95. The quantity and value of the sandalwood sold on account of Government in Mysore and Coorg during the year were as follows :— Sandalwood.

		Tons.	Amount realized. Per ton.	Amount realized. Total.
			Rs.	Rs.
Mysore ...	Good wood	897¾	427	3,83,551
	Inferior wood	111¾	52	5,785
Coorg ...	Good wood	78¾	400	31,500
	Inferior wood	17	32	544
		1,105¼	380	4,21,380

96. The quantities of teak timber brought from Government Forests in British Burma, imported from foreign territory and exported from Rangoon and Moulmein, were as follows, as compared with the average quantities during the last seven years. It will be observed that neither the yield of the British Forests nor the imports from beyond the frontier into Burma have shown signs of decrease. Trade in Teak Timber.

PERIOD.	Yield of Government Forests in British Burma.	Imports from Foreign Territory.	Exports from Rangoon and Moulmein.
	(In tons of 50 cubic feet)		
Average of 7 years from 1870-71 to 1876-77 ...	46,688	169,506	125,202
Ditto 1877-78	49,913	208,198	161,176

Of the quantity exported, 57,559 tons were shipped to non-Indian ports.

97. Statement II appended to this Review gives the Forest revenue and expenditure of all provinces during the last fourteen years. As regards surplus revenue, the year 1877-78 has been better than 1876-77, but has not equalled 1875-76. Financial results compared with those of previous years.

Excluding Mysore and Berar, the surplus Forest revenue from the British provinces during the last three years has been as follows :—

PRESIDENCY.	Years. 1875-76.	1876-77.	1877-78.
	Rs.	Rs.	Rs.
Bengal	22,86,840	12,51,706	19,47,038
Madras	(Def. 3,724)	1,342	21,671
Bombay	4,70,195	3,94,716	4,04,585
Total	27,53,311	16,47,764	23,73,294

98. The following data, which show the great and steady progress that has been made in Forest administration in the Bombay Presidency, may interest the readers of this Review. The area of the demarcated Reserves in the Area of Reserves in the Bombay Presidency.

three great divisions, or Forest Circles of the Bombay Presidency, was as follows on the 31st March 1878:—

	Square Miles.	Acres.
Sind	536	343,326
Northern Division	4,407	2,821,001
Southern "	1,695	1,083,945
Total	6,638	4,248,272

This is a splendid property, and the gross revenue yielded by it has during the year amounted to—

	Gross Revenue. Rs.	Per Square Mile. Rs.
Sind	3,66,421	684
Northern Division	5,42,291	123
Southern "	3,52,817	208
Total	12,61,529	190

Yield per acre of the Sind Forests

99. The yield in material and money per acre has been worked out for the Sind Forests only, in the manner first adopted in the Report on the Sind Forests which the writer of this Review submitted after his inspection in 1869. The following are the results of the earlier and later years:—

	Yield per Acre. In cubic feet.	In money. Rs.	A.	P.
1866-67	5·2	0	12	5
1867-68	5·1	0	12	11
* *	*	*	*	
1874-75	5·8	0	12	4
1875-76	5·8	0	12	9
1876-77	7·5	0	15	8
1877-78	7·4	1	1	1

The total yield of the Sind Forests in firewood has considerably increased since 1866.

	Maunds.
1866-67	8,54,206
1867-68	8,49,628
* * * *	*
1874-75	11,30,103
1875-76	11,06,715
1876-77	14,30,254
1877-78	14,03,413

Protection and improvement of the Forests

100. As regards protection and improvement of the Forests, it is noteworthy that Colonel Peyton has been most successful in protecting against fire the Forests along the ghâts in Belgaum and Kanara, chiefly with the aid of his excellent arrangements made for the departmental collection of myrobalans, adverted to in paragraph 94 of this Review. In Sind, fires were unusually bad in 1877-78. The Conservator has come to the correct conclusion, long disputed in Sind, that the only plan is to exclude the herdsmen from the tracts burnt, and to close them against grazing as a punitive measure.

Reproductive measures in Sind

101. The progress made in closing selected areas of the Sind Forests for reproduction is satisfactory. An aggregate area of 60,611 acres has thus been closed, and is reported to show good young growth; so that one-half of the area, or 30,000 acres, in the Hyderabad Division, have again been opened for grazing. It is to be hoped that these tracts have not been opened too soon.

As explained in paragraph 34 of the Sind report, Major McRae contemplates the working of Babul forests for fuel in certain places on a short rotation of fifteen to sixteen years, a plan which, if reproduction can be secured, will have many advantages.

General administration of Forests in the Bombay Presidency.

102. As regards general administration, the prominent feature of Forest administration in the Bombay Presidency is that the Revenue Commissioners take an active share in the Forest business, and that in Bombay proper district Forest officers submit their annual (and other) reports through Collectors, whose assistants for Forest matters they are under the organization of 1870. There is still occasional diversity of opinion on Forest matters between Revenue and Forest Officers, and it cannot be said that friction has altogether ceased, but the great advantage gained by the organization of 1870 seems to be that all differences are brought forward forthwith, that the Revenue Officers take an active share in the Forest administration, and that consequently important questions regarding which there is a difference of opinion between Forest and Revenue Officers are decided at once in a satisfactory manner.

STATEMENT I.

Summary of Revenue and Expenditure during the year 1877-78.

Budget Headings.	Bengal.	North Western Provinces.	Punjab.	Oudh.	Central Provinces.	British Burma.	Coorg.	Assam.	Ajmere.	Surveys.	Total of the British Provinces under the Government of India.	Mysore.	Berar.	Total of Mysore and Berar.	Grand Total of all Provinces.
Receipts—	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
I. Timber and other produce removed from the Forests by Government agency.	1,70,224	5,14,644	3,92,432	2,15,965	65,036	11,23,870	50,652	15,393	157	...	25,48,373	4,09,360	3,613	4,12,973	29,61,346
II. Timber and other produce removed from the Forests by consumers or purchasers.	2,51,763	2,74,034	2,68,126	1,82,478	5,72,820	1,18,785	22,787	1,16,970	1,378	...	18,09,141	44,078	2,70,318	3,14,396	21,23,537
III. Confiscated drift and waif wood ...	397	2,575	1,852	1,524	3,710	68,950	942	604	1	...	80,555	1,693	3,000	4,693	85,248
IV. Revenue from Forests not managed by Government.	...	...	689	2,985	1	2,82,933	...	1,070	...	...	2,87,678	...	...	...	2,87,678
V. Miscellaneous	3,844	8,903	20,611	...	42,343	8,485	26,634	289	1,466	...	1,12,575	3,457	2,300	5,757	1,18,332
Total Receipts ...	4,26,228	8,00,156	6,83,710	4,02,952	6,83,910	16,03,023	1,01,015	1,34,326	3,002	...	48,38,322	4,58,588	2,79,231	7,37,819	55,76,141
Expenditure—															
A. Conservancy and Works—															
I. Timber and other produce removed from the Forests by Government agency.	89,931	2,67,796	1,24,035	86,845	52,607	5,01,199	11,402	7,598	167	...	11,41,580	52,978	247	53,225	11,94,805
II. Timber and other produce removed from the Forests by consumers or purchasers.	13,757	20,088	1,530	3,475	90,792	4,291	...	2,675	...	...	1,36,608	...	11,255	11,255	1,47,863
III. Confiscated drift and waif wood ...	73	295	40	10	...	40,716	...	15	...	...	41,149	3	...	3	41,152
IV. Revenue from Forests not managed by Government.	...	...	...	...	...	99	...	...	...	...	99	...	...	...	99

V. Rent of leased Forests and payments to shareholders in Forests managed by Government.		10,383	33,699	...	...	...	...	50	...	...	44,132	...	18,682	18,682	62,814
VI. Live and dead stock	11,547	11,315	6,669	10,452	8,911	27,321	377	12,256	120	3,026	91,994	1.270	5,914	7,184	99,178
VII. Communications and Buildings ...	5.106	36,086	21,907	22,872	4,856	10,592	248	7,871	957	...	1,10,495	2,005	1,284	3,289	1,13,784
VIII. Demarcation, improvement and extension of Forests.	23,894	27,069	67,464	9,093	20,120	52,173	4,426	16,192	5,683	6,998	2,33,112	24,704	9,850	34,554	2,67,666
IX. Miscellaneous	2,549	2,196	3,605	1,823	1,115	3,671	...	2,297	34	...	17,290	253	2,483	2,736	20,026
Total Conservancy and Works ...	1,46,857	3,75,228	2,58,949	1,34,570	1,78,401	6,40,062	16,453	48,954	6,961	10,024	18,16,459	81,213	49,715	1,30,928	19,47,387
B—Establishments—															
I. Salaries	99,587	1,21,600	2,07,121	57,893	1,14,395	1,72,168	14,315	44,264	6,829	39,964	8,78,136	1,02,650	47,707	1,50,357	10,28,493
II. Travelling allowances	11,490	18,036	38,937	9,774	15,316	32,550	4,530	4,978	694	7,052	1,43,357	12,010	7,376	19,386	1,62,743
III Contingencies	3,277	7,414	12,159	3,710	9,566	11,036	969	2,091	442	2,668	53,332	3,050	5,170	8,220	61,552
Total Establishments ...	1,14,354	1,47,050	2,58,217	71,377	1,39,277	2,15,754	19,814	51,333	7,965	49,684	10,74,825	1,17,710	60,253	1,77,963	12,52,788
Grand Total of Expenditure ...	2,61,211	5,22,278	5,17,166	2,05,947	3,17,678	8,55,816	36,267	1,00,287	14,926	59,708	28,91,284	1,98,923	1,09,968	3,08,891	32,00,179
Surplus ...	1,69,017	2,77,878	1,66,544	1,97,005	3,66,232	7,47,207	64,748	34,287	...	...	20,18,670	2,59,665	1,69 263	4,28,928	24,47,598
Deficit	...	...	...	...	...	...	...	...	11,924	59,708	71,632	...	...	...	71,632

STATEMENT II.

Receipts and Charges of the Forest Department throughout India during the fourteen years from 1864-65 *to* 1877-78.

RECEIPTS.

Provinces.	1864-65.	1865-66.	1866-67 (11 months).	1867-68.	1868-69.	1869-70.	1870-71.	1871-72.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	1877-78.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Bengal	..	38,584	50,555	75,687	2,24,546	1,13,753	1,19,678	1,39,088	1,49,851	1,16,633	1,85,933	1,98,274	2,22,401	4,26,228
North-Western Provinces .	6,39,010	6,50,401	5,77,954	5,11,191	6,53,389	7,26,255	3,65,076	10,33,134	16,42,856	16,29,496	10,85,947	9,69,698	7,61,658	8,00,156
Punjab	2,95,730	2,08,050	2,31,470	2,79,297	3,45,164	3,94,132	10,40,368	7,35,002	6,52,994	7,32,540	8,34,874	9,05,742	5,98,754	6,83,710
Oudh	54,634	1,19,969	2,01,246	66,453	1,31,822	1,06,822	60,181	1,37,767	2,96,258	3,03,181	2,77,411	2,94,658	3,89,013	4,02,952
Central Provinces	89,307	2,02,644	3,67,095	3,49,491	3,50,536	4,16,020	6,58,120	4,47,764	4,81,673	5,68,367	6,61,779	7,25,335	6,61,326	6,83,910
British Burma	9,36,233	8,98,629	4,24,053	6,47,590	8,16,171	9,84,773	8,18,124	7,72,399	8,27,469	10,68,621	10,74,802	17,79,020	15,51,468	16,03,023
Coorg	1,02,218	1,08,257	31,934	77,746	74,448	1,08,152	74,067	92,453	84,424	1,10,079	58,012	1,07,457	75,929	1,01,015
Ajmere	...	...	...	...	...	...	...	...	24	508	203	410	905	3,002
Assam	...	...	...	...	...	...	...	...	...	62,726	64,749	1,07,302	81,568	1,34,326
Surveys	...	...	..	...	...	...	...	...	...	...	...	...		...
Total ...	21,17,132	22,26,534	18,84,307	20,07,455	25,96,076	28,49,907	31,35,614	33,57,607	41,35,549	45,92,151	42,43,710	50,87,896	43,43,022	48,38,322
Madras	3,11,778	3,26,204	3,38,608	4,24,184	3,91,179	4,95,789	3,39,762	4,18,882	4,18,767	4,64,194	3,64,326	4,26,359	4,15,312	4,04,164
Bombay and Sind	10,70,210	10,07,610	8,21,268	8,84,245	12,13,482	12,35,257	11,77,425	11,50,210	11,46,404	11,88,090	12,23,995	12,48,672	12,26,658	12 61,529
Total Revenue (British India)	34,99,120	35,60,348	30,44,183	33,15,884	42,00,737	45,80,953	46,52,801	49,26,699	57,00,720	62,44,435	58,32,031	67,62,927	59,84,992	65,04,015
Mysore	3,16,331	3,42,959	2,66,020	4,10,012	3,51,476	2,95,218	3,37,669	3,99,511	3,76,185	4,97,060	3,83,124	4,56,271	4,66,956	4,58,588
Hyderabad	2,368	15,106	43,574	53,446	84,556	1,45,481	1,77,329	1,55,544	2,59,861	2,63,256	2,60,674	2,32,817	2,53,136	2,79,231
Total Revenue (Mysore and Hyderabad)	3,18,699	3,58,065	3,09,594	4,63,458	4,36,032	4,40,699	5,14,998	5,55,055	6,36,046	7,60,316	6,43,798	6,89,088	7,20,092	7,37,819
GRAND TOTAL OF REVENUE	38,17,819	39,18,413	33,53,777	37,79,342	46,36,769	50,21,652	51,67,799	54,81,754	63,36,766	70,04,751	64,75,829	74,52,015	67,05,084	72,41,834

STATEMENT II—*continued.*

A—Expenditure on Conservancy and Works.

Provinces.	1864-65.	1865-66.	1866-67 (11 months).	1867-68.	1868-69.	1869-70.	1870-71.	1871-72.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	1877-78.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Bengal	2,092	19,480	89,326	1,41,382	95,581	61,004	26,272	43,907	28,526	28,552	39,062	68,255	90,172	1,46,857
North-Western Provinces ...	3,29,983	2,06,272	2,28,186	2,04,249	3,10,303	2,95,969	5,41,957	8,16,519	8,67,314	8,21,813	7,16,878	3,91,385	4,95,352	3,75,228
Punjab	1,62,120	1,94,110	1,76,950	1,75,920	1,93,[illegible]	5,55,375	10,30,005	4,78,003	5,45,068	3,54,457	4,19,305	3,18,498	2,70,330	2,58,949
Oudh	52,797	38,886	38,001	70,569	59,566	63,180	52,872	79,412	87,201	1,51,178	1,58,161	1,48,950	1,54,650	1,34,570
Central Provinces	35,610	38,504	46,817	1,13,068	1,86,925	3,65,801	1,95,251	1,24,621	1,33,666	1,67,010	1,78,513	2,40,523	1,67,334	1,78,401
British Burma	1,77,158	2,21,769	2,04,591	2,25,049	3,22,981	3,11,404	2,89,445	2,45,514	2,03,929	3,32,391	5,31,841	6,60,515	8,22,064	6,40,062
Coorg	4,688	3,995	4,425	5,354	7,175	22,851	14,822	20,714	18,324	23,001	23,773	25,991	18,493	16,453
Ajmere	...	...	...	...	...	...	...	...	4,878	15,777	17,753	12,963	11,433	6,961
Assam	...	...	...	...	...	...	...	...	...	18,901	31,138	33,187	42,005	48,954
Surveys	...	...	...	...	...	...	...	...	8,303	7,420	3,906	5,134	7,684	10,024
Total ...	7,64,448	7,22,986	7,88,296	9,35,591	11,76,047	16,75,584	21,50,624	18,08,690	18,97,209	19,20,500	21,20,330	19,05,401	20,79,517	18,16,459
Madras	94,657	1,36,528	1,14,251	1,62,037	1,32,693	1,46,821	1,56,779	1,94,814	3,03,735	1,75,370	2,21,864	2,39,945	1,94,943	1,59,867
Bombay and Sind	3,17,699	5,63,067	4,36,470	3,32,175	3,87,412	3,28,985	3,84,638	3,27,729	4,34,612	4,11,547	5,20,049	4,80,801	5,30,394	5,36,477
Total (British India) ...	11,76,804	14,22,581	13,39,017	14,29,803	16,96,152	21,51,390	26,92,041	23,31,233	26,35,556	25,07,417	28,62,243	26,26,147	28,04,854	25,12,803
Mysore	14,022	42,979	32,165	52,317	59,274	44,252	81,061	87,326	95,959	1,12,460	1,08,401	1,10,772	1,09,761	81,213
Hyderabad	...			2,184	6,552	22,018	43,034	62,759	45,062	44,117	45,514	42,287	40,506	49,715
Total (Mysore and Hyderabad)	14,022	42,979	32,165	54,501	65,826	66,270	1,24,095	1,50,085	1,41,021	1,56,577	1,53,915	1,53,059	1,50,267	1,30,928
GRAND TOTAL ..	11,90,826	14,65,560	13,71,182	14,84,304	17,61,978	22,17,660	28,16,136	24,81,318	27,76,577	26,63,994	30,16,158	27,79,206	29,55,121	26,43,731

STATEMENT II—*continued.*

B.—Expenditure on Establishments.

PROVINCES.	1864-65.	1865-66.	1866-67 (11 months).	1867-68.	1868-69.	1869-70.	1870-71.	1871-72.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	1877-78.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Bengal	6,604	16,292	14,881	24,223	30,676	34,870	60,186	64,429	71,090	56,936	60,341	70,831	1,21,517	1,14,354
North-Western Provinces ...	65,739	86,242	83,711	85,139	1,01,475	1,27,441	1,33,928	1,53,751	1,51,698	1,44,693	1,38,997	1,46,529	1,32,288	1,47,050
Punjab	84,665	77,968	78,680	97,955	1,15,828	1,58,279	2,03,951	2,27,321	2,50,874	2,42,705	2,27,175	2,35,728	2,52,153	2,58,217
Oudh	27,154	19,883	21,571	23,065	29,615	42,090	47,119	47,269	56,219	48,256	46,666	49,465	77,959	71,377
Central Provinces	61,946	74,994	81,041	99,031	1,07,730	1,08,445	1,12,182	1,07,059	1,11,171	1,16,546	1,15,726	1,30,240	1,21,306	1,39,277
British Burma	86,081	90,327	80,544	1,03,339	99,191	1,10,058	1,11,293	1,32,935	1,32,095	1,42,140	1,30,797	1,54,235	1,82,980	2,15,754
Coorg	4,201	8,654	7,127	8,610	9,301	10,231	9,777	10,267	11,340	11,708	14,226	11,688	14,836	19,814
Ajmere	...	...	...	...	...	...	...	...	8,177	8,563	8,813	14,383	11,025	7,965
Assam	...	...	...	...	...	...	...	...	...	31,721	28,385	28,697	47,915	51,333
Surveys	...	...	...	...	...	...	...	...	12,875	42,852	57,614	53,859	49,820	49,684
Total of Establishment Charges ...	3,36,390	3,74,360	3,67,555	4,41,362	4,93,816	5,91,414	6,78,436	7,43,031	8,08,539	8,46,120	8,28,740	8,95,655	10,11,799	10,74,825
TOTAL OF ALL CHARGES ...	11,00,838	10,97,346	11,55,851	13,76,953	16,69,863	22,66,998	28,29,060	25,51,721	27,05,748	27,66,620	29,49,070	28,01,056	30,91,316	28,91,284
Madras	95,300	1,17,054	1,02,920	1,26,223	1,37,779	1,39,870	1,38,081	1,50,902	1,74,412	1,77,814	1,76,008	1,90,138	2,19,027	2,22,626
Bombay	2,10,352	2,11,987	2,10,973	2,14,962	2,[illegible],711	2,15,811	2,38,125	2,57,035	2,78,430	2,93,990	2,96,071	2,97,676	3,01,548	3,20,466
Total of Establishment Charges (British India)	6,42,042	7,03,401	6,81,448	7,82,547	8,71,306	9,47,095	10,54,642	11,50,968	12,61,381	13,17,924	13,00,819	13,83,469	15,32,374	16,17,918
TOTAL OF ALL CHARGES (BRITISH INDIA)	18,18,846	21,25,982	20,20,465	22,12,350	25,67,458	30,98,485	37,46,683	34,82,201	38,96,937	38,25,341	41,63,062	40,09,616	43,37,228	41,30,721
Mysore	53,018	54,768	53,823	57,725	60,677	59,998	64,381	71,776	96,159	1,23,773	1,28,321	1,24,520	1,17,101	1,17,710
Hyderabad	478	8,991	13,718	16,157	27,553	58,692	38,938	38,071	37,994	41,523	45,875	48,586	54,146	60,253
Total of Establishment Charges (Mysore and Hyderabad) ...	53,496	63,759	67,541	73,882	88,230	1,18,690	1,03,319	1,09,847	1,34,153	1,65,296	1,74,196	1,73,106	1,71,247	1,77,963
GRAND TOTAL OF ESTABLISHMENT CHARGES	6,95,538	7,67,160	7,48,989	8,56,429	9,59,536	10,65,785	11,57,961	12,60,815	13,95,534	14,83,220	14,75,015	15,56,575	17,03,621	17,95,881
GRAND TOTAL OF ALL CHARGES ...	18,86,364	22,32,720	21,20,171	23,40,733	27,21,514	32,83,445	39,74,097	37,42,133	41,72,111	41,47,214	44,91,173	43,35,781	46,58,742	44,39,612

STATEMENT II—*concluded.*

C.—Surplus Revenue.

PROVINCES.	1864-65.	1865-66.	1866-67 (11 months).	1867-68.	1868-69.	1869-70.	1870-71.	1871-72.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	1877-78.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
British India, excluding Madras and Bombay	10,16,294	11,29,188	7,28,456	6,30,502	9,26,213	5,82,909	3,06,554	8,05,886	14,29,801	18,25,531	12,94,640	22,86,840	12,51,706	19,47,038
The Presidency of Madras ...	1,21,821	72,622	1,21,437	1,35,924	1,20,707	2,09,098	44,902	73,166	(Deficit 59,380)	1,11,010	(Deficit 33,546)	(Deficit 3,724)	1,342	21,671
" of Bombay ...	5,42,159	2,32,556	1,73,825	3,37,108	5,86,359	6,90,461	5,54,662	5,65,446	4,33,362	4,82,553	4,07,875	4,70,195	3,94,716	4,04,585
TOTAL NET REVENUE (BRITISH INDIA)	16,80,274	14,34,366	10,23,718	11,03,534	16,33,279	14,82,468	9,06,118	14,44,498	18,03,783	24,19,094	16,68,969	27,53,311	16,47,764	23,73,294
Mysore	2,49,291	2,45,212	1,80,032	2,99,970	2,31,525	1,90,968	1,92,227	2,40,409	1,84,067	2,60,827	1,46,402	2,20,979	2,40,094	2,59,665
Hyderabad	1,890	6,115	29,856	35,105	50,451	64,771	95,357	54,714	1,76,805	1,77,616	1,69,285	1,41,944	1,58,484	1,69,263
TOTAL NET REVENUE (MYSORE AND HYDERABAD) ...	2,51,181	2,51,327	2,09,888	3,35,075	2,81,976	2,55,739	2,87,584	2,95,123	3,60,872	4,38,443	3,15,687	3,62,923	3,98,578	4,28,928
GRAND TOTAL OF NET REVENUE	19,31,455	16,85,693	12,33,606	14,38,609	19,15,255	17,38,207	11,93,702	17,39,621	21,64,655	28,57,537	19,84,656	31,16,234	20,46,342	28,02,222

Govt. Central Branch Press, Simla,—No. 341, H., R. & A. D.—30-8-79.—350.